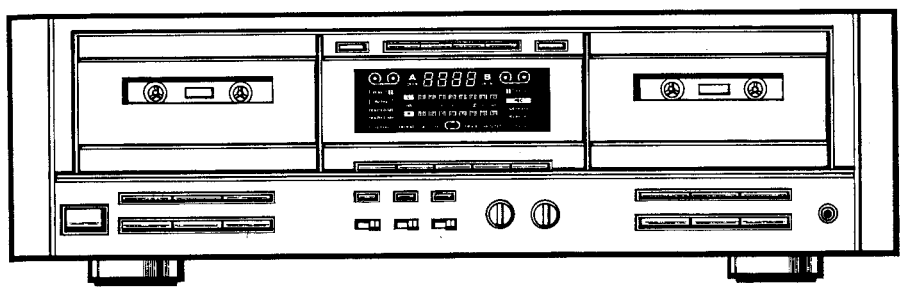
LENCO SYSTEM 3015

MODEL

SERVICE MANUAL

SERVICE MANUAL



SPECIFICATIONS

Systems . . . . . .4 Track, 2-channel Stereo

Heads . . . . . .Recording/Playback Head x 1
Playback Head x 1
Erasing Head x 1

Motors . . . . . .DC Servo Motor x 2
Reel Motor x 2

WOW & Flutter . . . . . .No more than 0.07%
(JIS WRMS): Nominal
No more than 0.14%
(JIS WRMS): Maximum

Frequency Response
–20dB Recording
Normal Tape . . . . . .25–15,000 Hz
CrO_2 Tape . . . . . .25–16,000 Hz
Metal Tape . . . . . .25–16,000 Hz
0dB Recording
Normal Tape . . . . . .25–11,000 Hz
CrO_2 Tape . . . . . .25–13,000 Hz
Metal Tape . . . . . .25–15,000 Hz

Signal to Noise Ratio
DOLBY NR Off . . . . . .More than 56dB

Noise Reduction Effect
DOLBY B NR on . . . . . .More than 10dB
(at 5 KHz)
DOLBY C NR on . . . . . .More than 19dB
(at 1.5KHz)

Input Sensitivity
Line (Input) 120mV/51KΩ

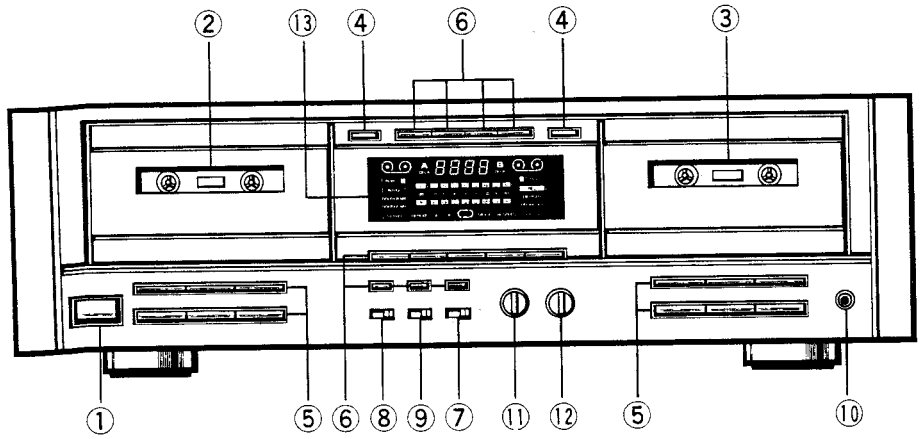
Output (Reference Level)
Line (Output) 316mV/5.0KΩ

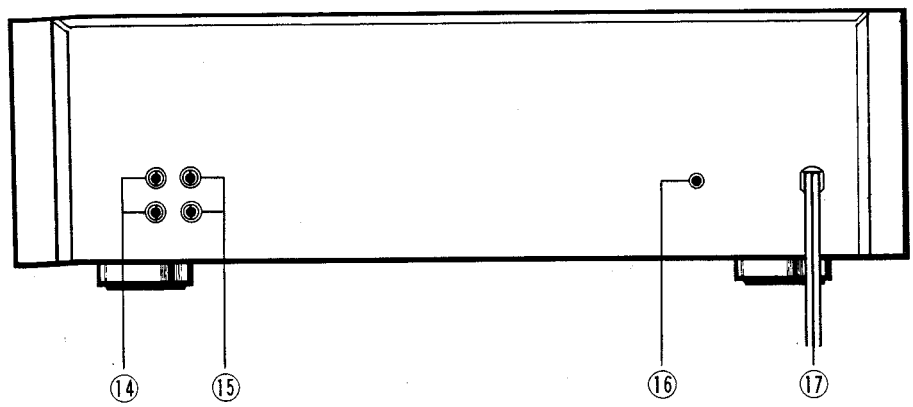
Subfunctions
Auto Reverse (2 Mode, ⇄, ↻)
Dolby B.C. NR HX PRO
Auto tape selector
Micro computer control
Relay & Skip function
Music search
Dubbing (Normal, High)
Auto Dubbing
Auto Playback
Repeat playback
Repeat A ↔ B Playback
Intro function
Mic Mixing
Counter Memory
Digital Counter
Counter A/B Selector
Timer (Recording/Playback)

Miscellaneous
Power Requirements AC230V, 50Hz
Power Consumption 37W
Dimensions . . . . . .458(W)x130(H)x300(D)mm
Weight (without package) 6.7Kg

Accessories
Operating Instructions 1
Connection Cord 2
Remote Cord 1

PANEL FEATURES





CONTROL ELEMENTS AND CONNECTION SOCKETS

1. POWER BUTTON
Press to turn ON, press again to turn OFF.

2. CASSETTE DECK A
Playback only.

3. CASSETTE DECK B
Playback and recording.

4. EJECT BUTTON
This button opens the cassette deck door.

5. TAPE DECK OPERATING BUTTONS

▶ (PLAY: FORWARD)	Press this button for forward playback or recording. When recording, press this button in pause mode.
◀ (PLAY: REVERSE)	Press this button for reverse playback or recording. When recording, press this button in pause mode.
■ (STOP)	Press this button to cancel all tape travel functions.
▶▶ (FAST FORWARD)	Press this button to wind tape in the right direction. When used in PLAYBACK mode performs a forward music search.
◀◀ (FAST REWIND)	Press this button to wind tape in the left direction. When used in PLAYBACK mode performs a reverse music search.
❚❚ (PAUSE)	Press this button to temporarilty stop the tape motion during.

6. FUNCTION BUTTONS

AUTO DUB/AUTO PLAY	This buttons controls the AUTO DUBBING and AUTO PLAY functions.
NORMAL DUBBING	To dubbing (copy) a tape cassette from deck A to deck B at normal speed. For AUTO DUBBING (Normal Speed) function, press this switch and AUTO DUBBING together.
HIGH DUBBING	High speed dubbing from deck A to deck B, at twice the normal speed. For HIGH SPEED AUTO DUBBING, press this switch and AUTO DUBBING together.
RECORD(DECK B)	This button can be used for recording. This button is pressed, then the player unit enters the REC PAUSE mode.
REC MUTE(DECK B)	When this button is pressed during recording, a blank space of about 4 seconds is recorded on the tape. The player then enters the PAUSE mode.
REPEAT	When this button is pressed during playback, one music is repeated play (5 times).
REPEAT A ↔ B	When this button is pressed during playback, playback repeatedly between two point on a tape cassette (5 times).
INTRO	When this button is pressed during playback, 10 seconds of each music shall be played.
MEMORY	When this button is pressed, the tape will automatically stop at the desire position.
RELAY & SKIP	When this button is pressed, playback is relayed from DECK A to DECK B or from DECK B to DECK A (5 times).
TAPE COUNTER A/B	Indicates the distance travelled the tape in DECK A and DECK B.
RESET	Resets tape counter to "0000".

7. TIMER SWITCH

This switch is used for timer recording and playback when the optional timer is used. Leave this swtich off at all times when these functions are not being used.

REC : Timer recording.
PLAY : Timer playback.

* Timer playback is possible with either DECK A or DECK B, but only DECK B can be used for timer recording.
* When the timer turns ON, tape travel will begin from the forward (►) direction.

8. REVERSE MODE SWITCH

This switch can be used for both DECK A and DECK B.

⇄ : This switch is used to record and playback one side of a tape.
The tape will stop automatically when fully rewind.

↻ : Unless the STOP button is pressed, both sides of the tape will be playback 5 times each (total of 10 sides)
Select this position to record on both sides of the tape.
Auto reverse is only possible from the (►) to the (◄) direction. If recording is started in the (◄) direction, the tape will stop automatically at the end of the first side. To record both sides, always start from the (►) direction.

9. DOLBY NR SWITCH

This switch controls the Dolby noise reduction system.

B : Dolby B NR provides 10dB of improvement in S/N ratio.
C : Dolby C NR provides 20dB of improvement in S/N ratio.
OFF : Dolby noise reduction system OFF.

* Always use the same Dolby setting for recording and playback.
* Dolby noise reduction and HX Pro headroom extension are manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen.
* "Dolby" the double – D Symbyl ⧈ and "HX Pro" are trademarks of Dolby Laboratories Licensing Corporation.

10. MIC JACK

Insert the microphone plug into this jack for microphone recording or mixing during playback or dubbing.

11. MIC VOLUME CONTROL

Turn clockwise to increase microphone input level.

12. REC LEVEL CONTROL

Adjust the recording signal level.

13. FLT DISPLAY

These light to indicate the operation of the tape.

14. REC INPUT TERMINAL

Connect the INPUT terminal of the tape deck to the TAPE REC terminal of the amplifier.

15. PLAYBACK OUTPUT TERMINAL

Connect the OUTPUT terminal of the tape deck to the TAPE PLAYBACK terminal of the amplifier.

16. REMOTE TERMINAL

Connect the REMOTE terminal of the tape deck to the REMOTE terminal of the tuner.

17. POWER IN CORD

Insert power plug into a standard 230V/50Hz household power outlet.

ADJUSTMENT

Mechanical Adjustments

Tape Speed Adjustment

1. Load the TCC-112 test tape into DECKs A and B.
2. Switch DECK A(B) into the PLAY state. Then connect TP.10 to 11 with the deck in high speed state and adjust with VR501(531) so that the frequency becomes 6000 Hz ± 20 Hz.
3. After releasing the short circuit mentioned in step 2, put DECK A(B) into normal speed PLAY state, and adjust VR502(532) so that the frequency of it becomes 3000 Hz ± 5 Hz.

Electrical Adjustment

Adjustment Condition

1. The mechanical adjustments must be completed first.
2. The head must be cleaned and demagntetized.
3. Allow the deck to age for least a few minutes before commencing any electrical adjustments.
4. The reference signal is 0 dBV = 1 Vrms.
5. Connect a 50 kilo-ohm (or between 47 to 52 kilo-ohm) load resistance to the OUTPUT terminals.
6. Unless otherwise specified, the switches listed below are left in the positions indicated.
   DOLBY NR : OFF
   TAPE SELECTOR : NORMAL

TEST TAPE

1. TCC-161 : Playback adjustments (frequency, level)
2. TCC-121 : Playback adjustments (level)
3. TCC-130 : Playback adjustments (level)
4. AC-224 : NORMAL blank tape
5. AC-513 : CHROME blank tape
6. AC-712 : METAL blank tape

List of Adjustments

Playback section

1. Head azimuth adjustment.
2. Playback frequency response check.
3. Playback level adjustment.
4. Playback time constant switching check.

Recording section

1. MPX filter adjustment.
2. Recording bias adjustment.
3. Recording level adjustment.
4. Recording and playback frequency response check.
5. Bias filter adjustment.
6. Copy mode playback frequency response check.
7. Level meter check.

DECK A and B

(PLAYBACK SECTION)

1. Head Azimuth Adjustment

Turn VR102, 202 to mechanical center positions.

NO.	MODE	Input signal, test tape	Adjustment location	Measuring location	Adjustment value
1	PLAY	10 KHz / –24 dB TCC-161B	Head azimuth adjustment screw	LINE OUT	Maximum playback signal level
2	STOP	Lock the screw with screw lock after completeing adjustment.			

2. Playback Frequency Response Check

NO.	MODE	Input signal, test tape	Adjustment location	Measuring location	Adjustment value
1	PLAY	TCC-161B		LINE OUT	The allowable zone shown in Fig. 1 is to be satisfied.

3. Playback Level Adjustment DECK A (Check DECK B)

NO.	MODE	Input signal, test tape	Adjustment location	Measuring location	Adjustment value
1	PLAY	TCC-130	VR102 (L ch) VR202 (R ch)	TP. L TP. R	– 6 dBm

4. Playback Time Constant Switching Check

Put the deck into playback mode with 120's none recording cassette loaded.

Check that the noise level changes at the line playback output terminals when the playback mode with 70's none recording cassette loaded.

DECK B

1. MPX Filter Adjustment

NO.	MODE	Input signal, test tape	Adjustment location	Measuring location	Adjustment value
1	REC/ PAUSE	19 KHz / 0 dBV (NR B on)	L 121 (L Ch) R 221 (R Ch)	LINE OUT	Minimum 19 KHz level

2. Recording Bias Adjustment

After the adjustment caution should be exercised so as not to become under bias by checking the distortion rate.

NO.	MODE	Input signal, test tape	Adjustment location	Measuring location	Adjustment value
1	STOP	Load the AC-712 test tape into DECK B.			
2	REC/ PAUSE	None	L 331 (BIAS OSC Coil)	E/H wire	105 KHz ± 300 Hz
3	REC/ PAUSE	None	VR 431 (L Ch) VR 441 (R Ch)		Minimum
4	REC/ PAUSE	None	L 431 (L Ch) L 441 (R Ch)	Pin 3 Pin 4	+25.5 dBV
5	STOP	Load the AC-224 test tape into DECK B.			
6	REC/ PAUSE	AC-224 (NORMAL) 315 Hz / 0 dBV	REC VOLUME	LINE OUT	−30 dBV
7	REC	AC-224 (NORMAL) 0 dBV	VR 431 (L Ch) VR 441 (R Ch)	LINE OUT	0.8 dB ± 0.3 10KHz/315Hz

3. Recording Level Adjustment

NO.	MODE	Input signal, test tape	Adjustment location	Measuring location	Adjustment value
1	STOP	Load the AC-224 test tape into DECK B.			
2	REC/ PAUSE	315Hz / 0 dBV	REC VOLUME	LINE OUT	−10 dBV
3	REC/ PAUSE	Record the above signal onto the AC-224 test tape and playback.	VR 151 (L Ch) VR 251 (R Ch)	LINE OUT	−10 dBV
4	STOP	Load the AC-513 test tape into DECK B.			
5	REC/ PAUSE	Record the above signal onto the AC-513 test tape and playback.	Check	LINE OUT	−10 dBV ± 1 dB
6	STOP	Load the AC-712 test tape into DECK B.			
7	REC/ PAUSE	Record the above signal onto the AC-224 test tape and playback.	Check	LINE OUT	−10 dBV ± 1 dB

4. Recording and Playback Frequency Response Check (Record level: 30 dBV)

NO.	MODE	Input signal, test tape	Adjustment location	Measuring location	Adjustment value
1	STOP	Load the AC-224 test tape into DECK B.			
2	REC/ PAUSE	AC-224 (NORMAL) NR; off/on (Type B/C)	Check	LINE OUT	The allowable zone show in Fig.2 is to be satisfied.
3	STOP	Load the AC-513 test tape into DECK B.			
4	REC/ PAUSE	AC-513 (CHROME) NR; off/on (Type B/C)	Check	LINE OUT	The allowable zone show in Fig.2 is to be satisfied.
5	STOP	Load the AC-712 test tape into DECK B.			
6	REC/ PAUSE	AC-712 (METAL) NR; off/on (Type B/C)	Check	LINE OUT	The allowable zone show in Fig.2 is to be satisfied.

5. Bias Filter Adjustment

NO.	MODE	Input signal, test tape	Adjustment location	Measuring location	Adjustment value
1	STOP	Load the none recording test tape into DECK A. Load the AC-712 test tape into DECK B.			
2	DUBB (X2)	DECK A: None record-ing tape. DECK B: AC-712	L 101 (L Ch) L 201 (R Ch)	TP DOL. L TP DOL. R	Minimum level

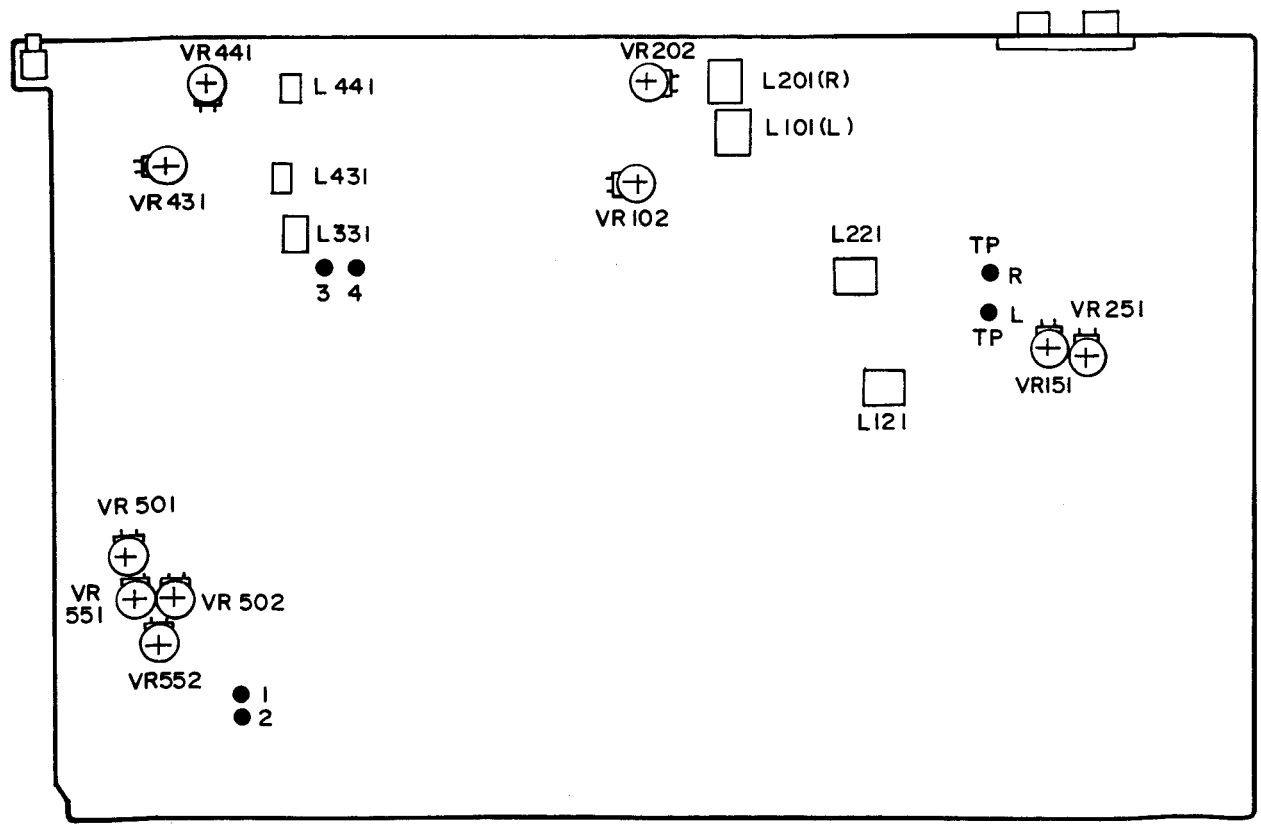
6. Dubbing Frequency Response Check
*DOLBY NR OFF

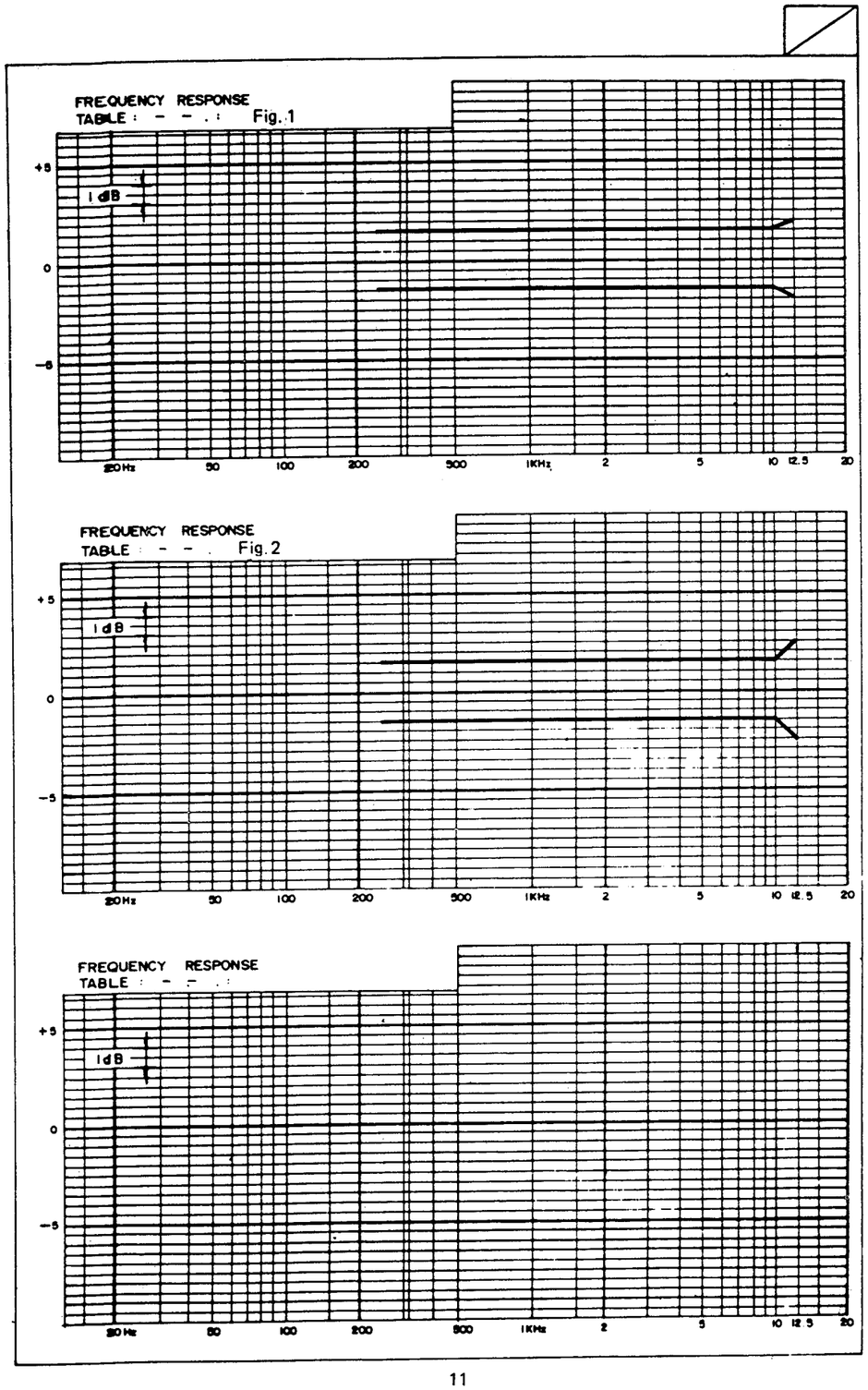
NO.	MODE	Input signal, test tape	Adjustment location	Measuring location	Adjustment value
1	STOP	Load the TCC-161B test tape into DECK A. Load the AC-224 test tape into DECK B.			
2	DUBBING X1, X2	DECK A: TCC-161 DECK B: AC-224			Copy recorded from TCC-161B (at both normal and double speeds)
3	PLAY	Play the signal recorded on the AC-224 test tape in the previous adjustment procedure.	Check	LINE OUT	The allowable zone show in Fig.2 is to be satisfied.
4	STOP	Load the AC-513 test tape into DECK B.			

NO.	MODE	Input signal, test tape	Adjustment location	Measuring location	Adjustment value
5	Repeat steps 2 and 3 check that the allowable zone show in Fig.2 is satisfied.				
6	STOP	Load the AC-712 test tape into DECK B.			
7	Repeat steps 2 and 3 check that the allowable zone show in Fig.2 is satisfied.				

6. Level Meter Check

NO.	MODE	Input signal, test tape	Adjustment location	Measuring location	Adjustment value
1	REC/ PAUSE	315 Hz / 0 dBV	REC VOLUME	LINE OUT	Check that the level meters "0 dB" light up within −10 dBV ±2 dB of the signal output level.





ELECTRICAL PARTS LIST

P.C. BOARD ASS'Y & OTHERS

217067801	:	MAIN P.C. BOARD
*A17A67801	:	MAIN UNIT ASS'Y
		CONTROL SWITCH UNIT ASS'Y
		VOLUME UNIT ASS'Y
217067901	:	SUB P.C. BOARD
*A17A67901	:	POWER UNIT ASS'Y
		FLT DISPLAY UNIT ASS'Y
		MIC AMP UNIT ASS'Y
		TRANSISTOR UNIT ASS'Y
220221001	:	SWITCH PUSH (POWER)
199810401	:	CERAMIC CAP. (SPARKILLER)
218861701	:	FUSE (T160mA/250V)
221110902	:	CORD AC (POWER)
820111501	:	BUSHING STRAIN RELIEF
221617301	:	DECK MECHANISM (PB)
221617401	:	DECK MECHANISM (R/P)

MAIN ASS'Y

REF. NO.	PARTS NO.	DESCRIPTION
● SEMICONDUCTORS		
IC431	244224154	μPC1297CA
IC102	244224054	μPC1330HA
IC101	244215275	TA7405PZ
IC201	244041701	CXA1331
IC181	244032063	BA335
IC501, 502	244134872	LB1641
IC902	244032463	BA10393
IC901	244033063	BA6138
IC503	260011801	TMP47C870N
IC241	244080731	GD4066B
IC151	244121971	KA4558S
Q337	240211625	KTC2236A-Y
Q332	240011025	KTA966-Y
Q509, 559	240010825	KTA950-Y
Q101,102,141-143,151-156,181,201,202,251-256,331,333,335,336,360,361,364,366,388,432,501,507,510,551,557,601,602,604	240211135	KTC1815-GR
Q332,334,362,365,431,441,603	240011835	KTA1015-GR
Q122,222	240215415	KTC2878-A
Q1-7,502-504,552-554	240610211	KRA2201
D1-7,151 331-334,360-363,431,441,501-504,551-554	241017995	ISS133
● VOLUME		
VR431,441,501,502,551,552	251210301	10K,RH0615C
VR102,202,151,251	251222301	22K,RH0615C
● COIL & FILTER		
L331	212935201	BIAS OSC 105KHz
L431,441	213850801	DOLBY HX PRO
L121,221	213851001	DOLBY MPX
L152,252	212926101	BIAS TRAP
L101,201	212930301	PB TRAP
L332	212921501	LINE
L151,251	101147221	4.7mH
● RESISTOR		
R515,516,565,566,350,351,344,345,164,264,509,559,508,558,340-343,32,511,506,507,556,557,561,562,514,563,601,513,564,135,235,132,148,36,38,517	1114□□□25 , 1/4W, 5%	
R518,519,567,568,569,603,607,10,149,332,373,510,560,34,37,170,242,270,553,602,604,605,606,915,361,147,157,257,134,140,234,910,912,914,916,247,		

REF. NO.	PARTS NO.	DESCRIPTION
331,374,17, 18,155,255, 183		
OTHER	1118□□□25	,1/8W, 5%
• CAPACITOR		
C181, 281	141610865	CEA 0.1, 20%, 50V
C154,254,184	141622865	CEA 0.22, 20%, 50V
C125,225	141633865	CEA 0.33, 20%, 50V
C182,185	141647865	CEA 0.47, 20%, 50V
C124,224	141656865	CEA 0.56, 20%, 50V
C104,105,121, 126,128,952, 141,142,143, 152,204,205, 221,226,228 902,241,242, 243,252,337,	141601065	CEA 1, 20%, 50V
C361,127,227	141622965	CEA 2.2, 20%, 50V
C108,161,208, 261,437,447, 901,951	141647965	CEA 4.7, 20%, 50V
C229,153,253	141310065	CEA 10, 20%, 16V
C144,162	141322065	CEA 22, 20%, 16V
C406	141333065	CEA 33, 22%, 16V
C336	141433065	CEA 33, 20%, 25V
C100,112,200, 106,206	141310165	CEA 100, 20%, 16V
C340	188F10155	CCDSL 101K, 10%, 500V
C338,444	188F18155	CCDSL 181K, 10%, 500V
C102,202	188633145	CCDSL 331J,5%, 50V
C435,445	188639145	CCDSL 391J, 5%, 50V
C101,201	188647145	CCDSL 471J, 5%, 50V
C103,203,109, 209	188656145	CCDSL 561J, 5%, 50V
C432,442	188682145	CCDSL 821J, 5%, 50V
C183,436,446, 900,903	175647395	CKDYF 473Z, +80-20%, 50V
C552,438,502	175610495	CKDYF 104Z, +80-20%, 50V
C155,255	150612245	CQMA 122J, 5%, 50V
C122, 123, 222, 223, 333	150622245	CQMA 222J, 5%, 50V
C151, 252, 331 332	150656245	CQMA 562J, 5%, 50V
C156,256,160, 260	150668245	CQMA 682J, 5%, 50V
C355	150E82245	CQMA 822J, 5%, 400V
C107,207,334, 431,441,157, 257	150610345	CQMA 103J, 5%, 50V

REF. NO.	PARTS NO.	DESCRIPTION
C159,259,501, 551	150615345	CQMA 153J, 5%, 50V
C110,158,210, 258,433,443	150622345	CQMA 223J, 5%, 50V
• OTHERS		
X101	213835901	CST 4.19MGW
WA103	216812101	2.5MM, 2P
WA101	216812201	2.5MM, 3P
WA2,10,11,12	216812301	2.5MM, 4P
WA102	216811601	2.5MM, 6P
WA1	216818501	2.5MM, 9P
WA6,7	216810501	2MM, 6P
WA3	216811101	2MM, 11P
WA4, 5	216812701	2MM, 14P
JACK 101	215550301	4P, PIN JACK
JACK 102	215551701	MINI JACK
1,2,3,4, L.R.	215537101	TERMINAL WRAPPING
CNA101,102,201	215916501	3P, 200MM
CNA103,202,203	215916801	7P, 200MM

CONTROL SWITCH UNIT ASS'Y

REF. NO.	PARTS NO.	DESCRIPTION
• SWITCH & OTHER		
S31-36, 41-46	220899901	KHH-10910
D31,32,41,42	241017995	ISS133
JP7	215931701	6P, 250MM
JP6	215935301	6P, 250MM

VOLUME UNIT ASS'Y

REF. NO.	PARTS NO.	DESCRIPTION
• VOLUME & OTHER		
VR231	250111301	REC, 50KAx2
VR401	250112901	MIC, 20KAx2
JP12	215929301	4P, 250MM
JP31	215964301	3P, 300MM
JP10	215935201	4P, 300MM
JP11	215931801	4P, 300MM

POWER UNIT ASS'Y

REF. NO.	PARTS NO.	DESCRIPTION
• SEMICONDUCTORS		
IC602	244203799	S-8053ALB
IC601	244121971	KA4558S
Q601,603,606	240211135	KTC1815-GR
Q605	240011835	KTA1015-GR
Q607	240011025	KTA966-Y
D601-604,606, 607,609,610	241358165	IN4003L
D608	241017995	ISS133
ZD1	242105135	IN751A
ZD2	242106245	IN753A
ZD3	242122035	IN969A
ZD4	242103655	IN747A
• RESISTOR		
R616	111810425	100K, 1/8W, 5%
OTHER	1114□□□25	1/4W, 5%5%
• CAPACITOR		
C600,603,610	141422267	CEA 2200, 20%, 25V
C612	141310267	CEA 1000, 20%, 16V
C604, 608, 615, 616	141522167	CEA 220, 20%, 35V
C617	141533067	CEA 33, 20%, 35V
C611	141610065	CEA 10, 20%, 50V
C607	141647965	CEA 47, 20%, 50V
C613, 614	141601065	CEA 1, 20%, 50V
C609	150610345	CQMA 103J, 5%, 50V
C601,602	175647395	CKDYF 473Z, +80-20%, 50V
C605,606	188F10155	CCDSL 101K, 10%, 500V
• OTHERS		
FU2	299911401	FUSE HOLDER
8,9,10	215537101	TERMINAL WRAPPING
T901	213141001	POWER 230V, 50Hz
JP1	215965501	9P, 100MM

FLAT DISPLAY UNIT ASS'Y

REF. NO.	PARTS NO.	DESCRIPTION
• FLAT & OTHER		
FLT1	214324001	B.G.893GK
S54-65	220899901	KHH-10910
S52,53	219016201	2C, 3P
S51	219016301	2C, 2P
D51-61	241017995	ISS133
R51, 52	111810325	10K, 1/8W, 5%
JP3	215931601	11P, 250MM
JP4	215935401	14P, 250MM
JP5	215931501	14P, 250MM
JP2	215917101	4P, 300MM

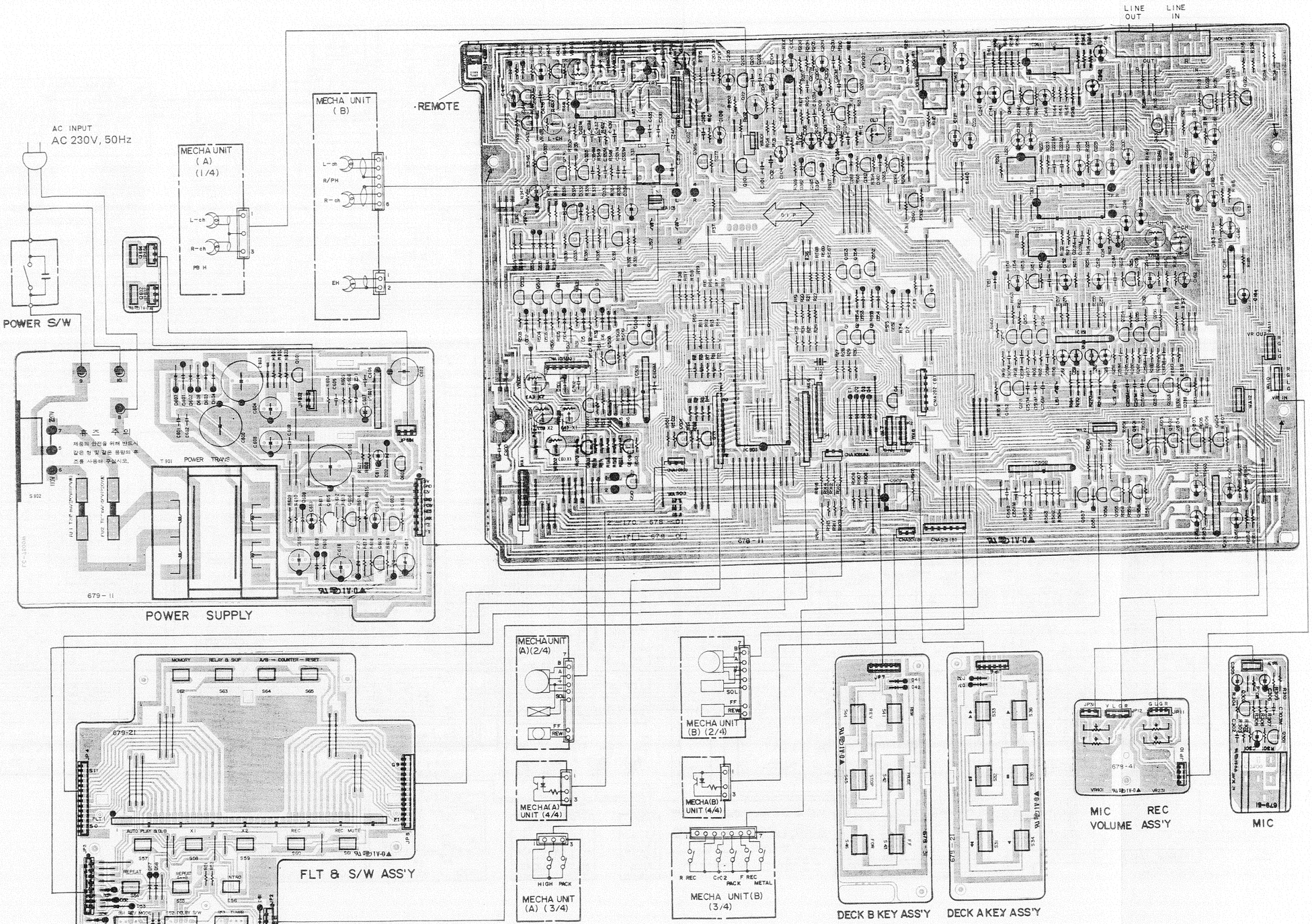
MIC AMP UNIT ASS'Y

REF. NO.	PARTS NO.	DESCRIPTION
• SEMICONDUCTOR		
Q301	240211135	KTC1815-GR
Q302	240011835	KTA1015-GR
• RESISTOR		
R310	111422325	22K, ¼W, 5%
R301-309	1118□□□25	, 1/8W, 5%
• CAPACITOR		
C305	141333065	CEA 33, 20%, 16V
C306	141310065	CEA 10, 20%, 16V
C301	141647865	CEA 0.47, 20%, 50V
C303	150633245	CQMA 332J, 5%, 50V
C302	171610255	CKDYB 102K, 10%, 50V
• OTHER		
WA31	216812201	2.5MM, 3P

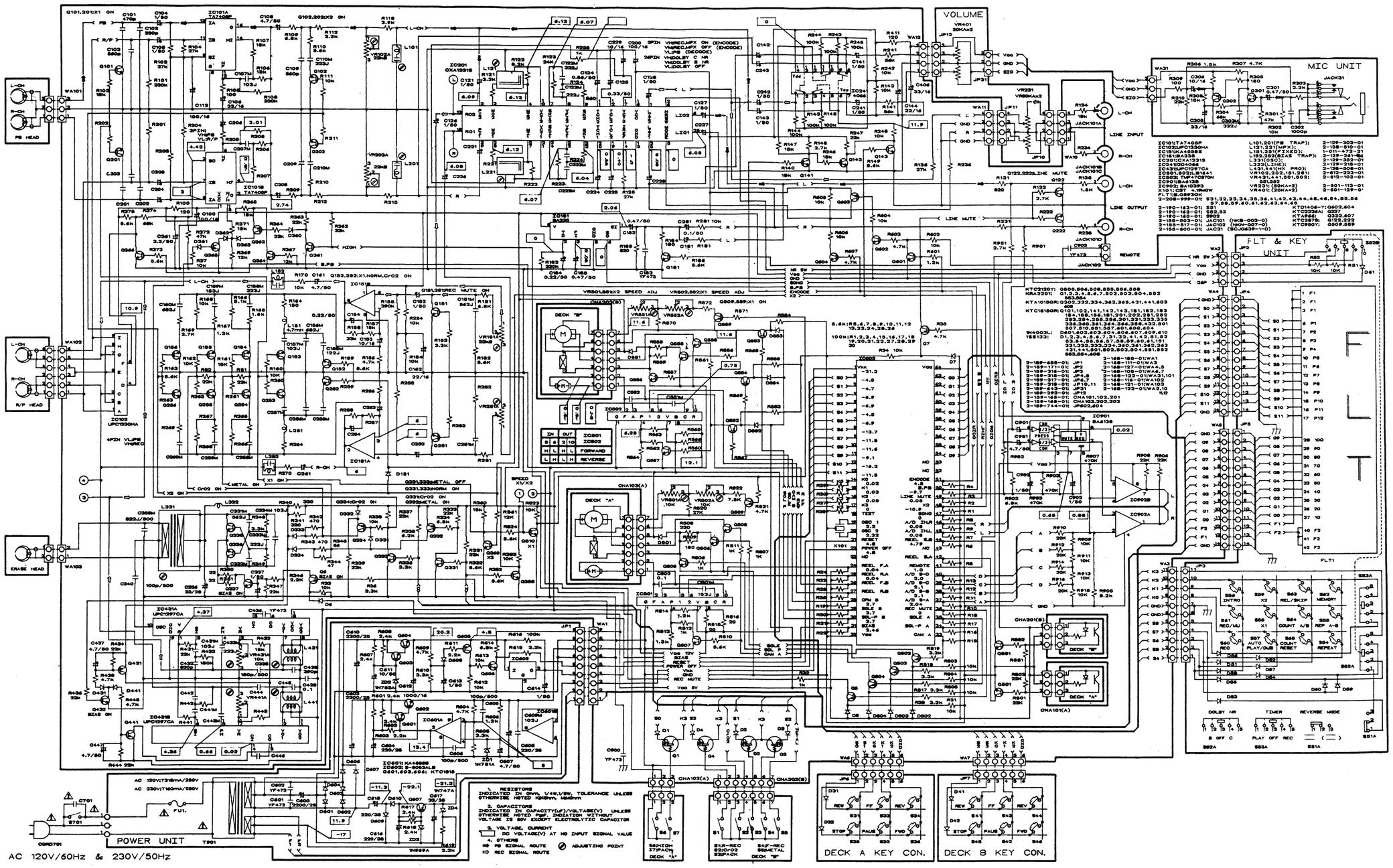
TRANSISTOR UNIT ASS'Y

REF. NO.	PARTS NO.	DESCRIPTION
• SEMICONDUCTOR		
Q602, 604	240215321	KTD1406-Y
• OTHER		
JP602, 604	215974401	3P, 150MM

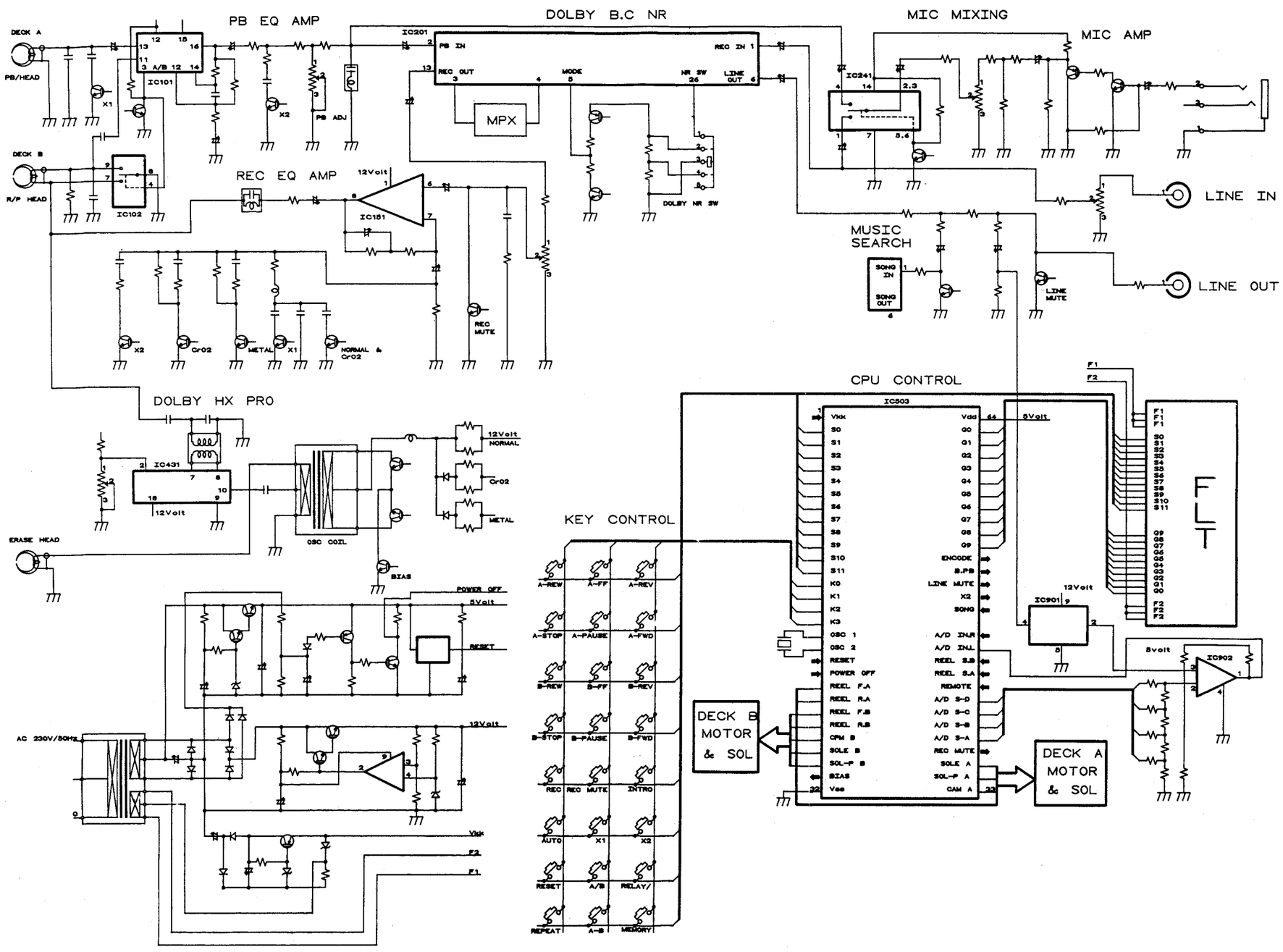
WIRING DIAGRAM



SCHEMATIC DIAGRAM



BLOCK DIAGRAM

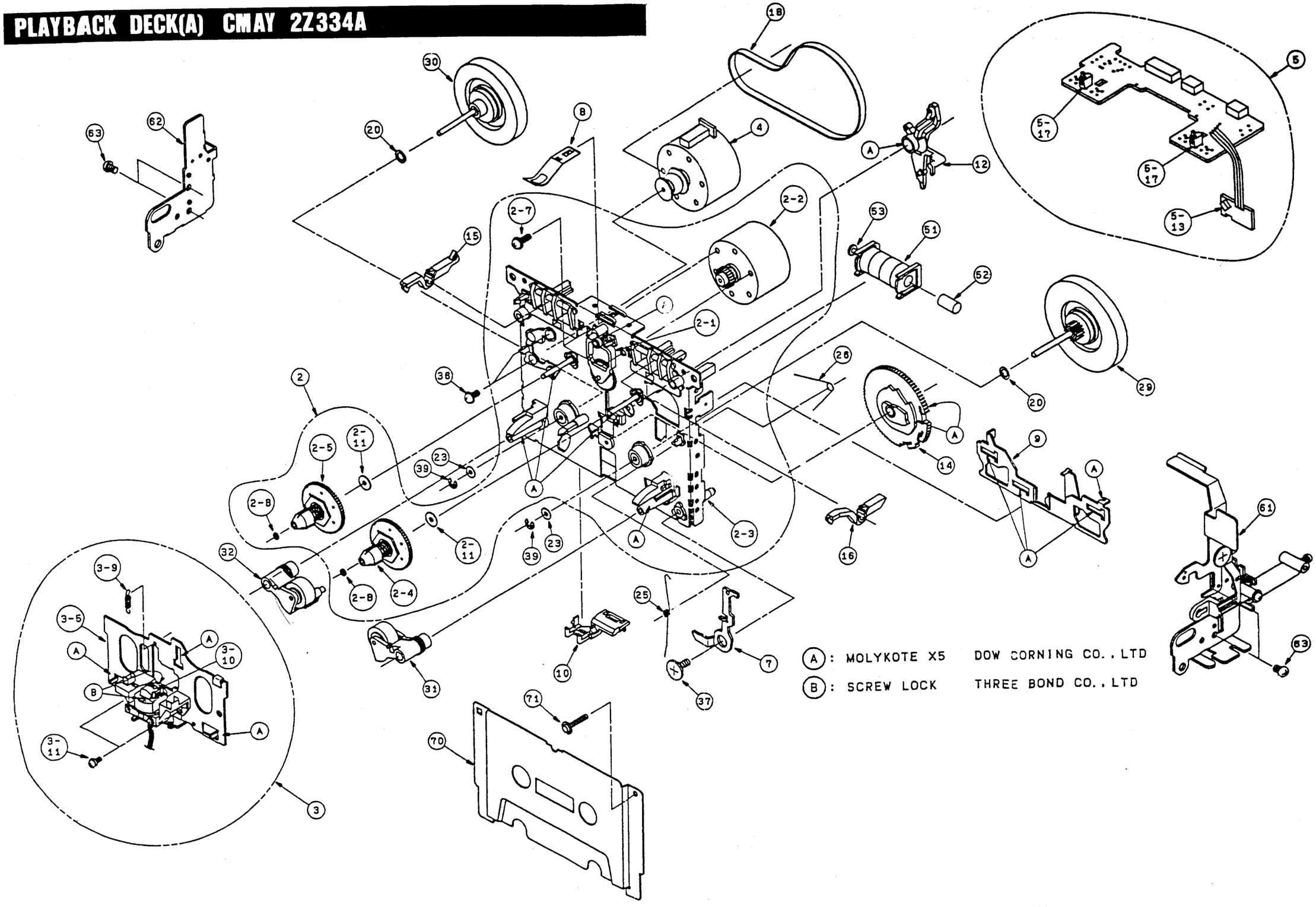


CMAY2Z333A, 334A PARTS TABLE

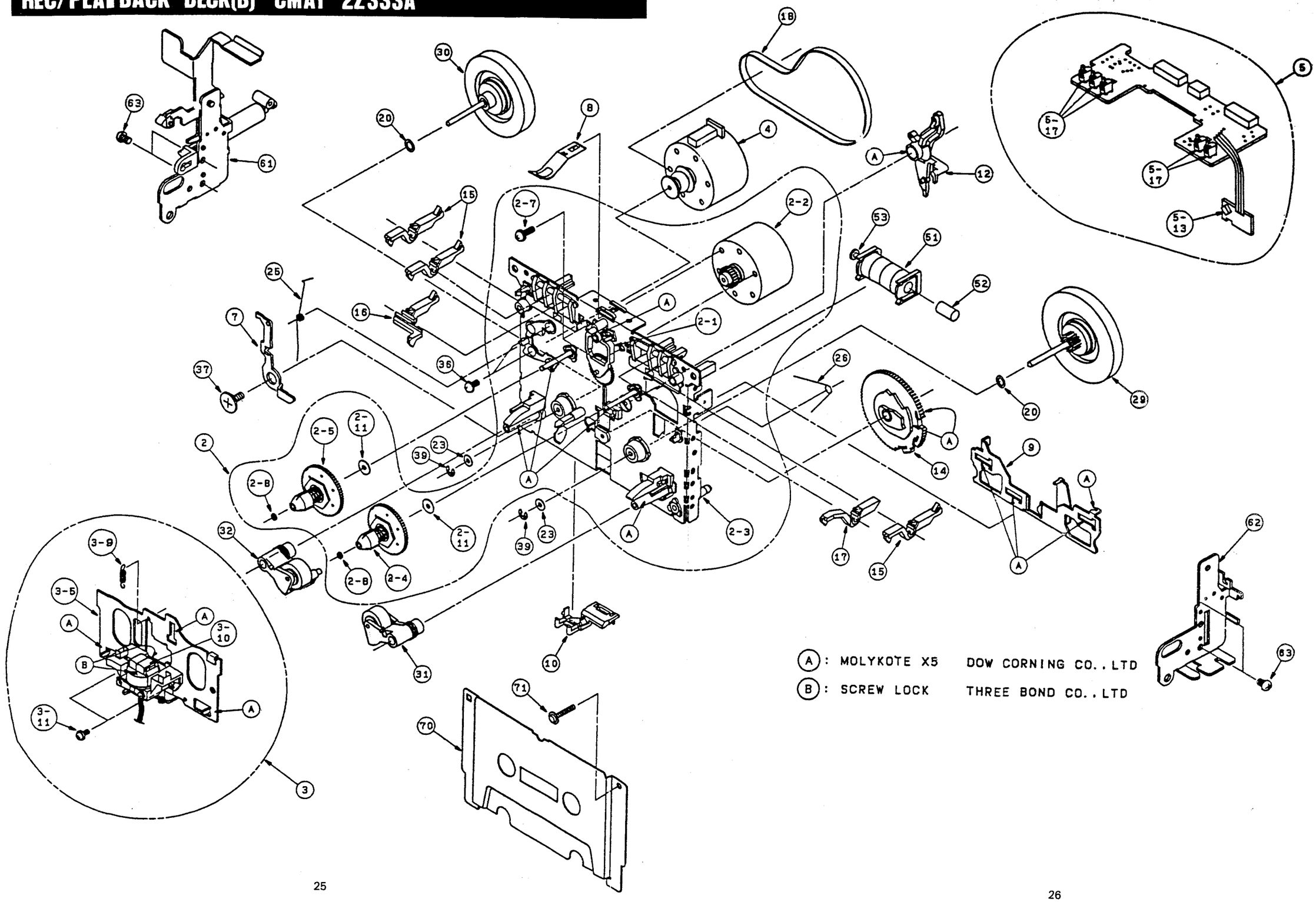
NO.	PARTS NO.	NAME	Q'TY	NOTE
2	F511–455	BLOCK CHASSIS	1	
2-1	F517–049	BLOCK IDLER	1	
2-2	F564–280	BLOCK MOTOR REEL	1	
2-3	F612–146	BLOCK BASE CHASSIS	1	
2-4	F623–037	BLOCK BASE REEL	1	
2-5	F623–127	BLOCK BASE REEL	1	
2-7	FG156–11A	SCREW	2	
2-8	FJ111–17	WASHER	2	
2-11	UJ12V–11	POLYSLIDER	2	
3	F513–514	BLOCK PLATE HEAD	1	CMAY2Z333
	F513-483			CMAY2Z334
3-5	FC52E–34	BASE HEAD	1	
3-9	FK26N–14	SPRING BASE HEAD	1	
3-10	FU17M–51	HEAD (HADKH5560A)	1	CMAY2Z333
	FU17W–51	HEAD (HADKH2516A)	1	CMAY2Z334
3-11	UG19D–11	SCREW	2	
4	F525–256	BLOCK MOTOR MAIN	1	
5	F567–308	BLOCK PCB CONTROL	1	CMAY2Z333
	F567-236			CMAY2Z334
5-13	AZ15S–00	SENSOR (GP2S04B)	1	
5-17	UE16E–11	PUSH SWITCH	5	CMAY2Z333
			2	CMAY2Z334
7	FC39L–70	ARM EJECT PREVENTIVE (L)	1	CMAY2Z333
	FC39M–68	ARM EJECT PREVENTIVE (R)	1	CMAY2Z334
8	FC52H–12	SPRING CASSETTE PUSHING	1	
9	FC52F–15	SLIDER	1	
10	FD45H–15	LEAD HOLDER	1	
12	FD45G–12	ARM PLAY	1	
14	FD45B–13	GEAR CAM	1	
15	FD44T–13	LEVER (REC SW)	3	CMAY2Z333
			1	CMAY2Z334
16	FD44Y–12	LEVER (PACK SW)	1	CMAY2Z334
	FD44V–12	LEVER (METAL SW)	1	CMAY2Z333
17	FD44Y–12	LEVER (PACK SW)	1	CMAY2Z333
18	FF17G–21	BELT MAIN	1	
20	FJ111–30	POLYSLIDER	2	
23	FJ111–14	POLYSLIDER	2	
25	FK28M–15	SPRING EJECT PREVENTIVE (L)	1	CMAY2Z333
	FK28L–15	SPRING EJECT PREVENTIVE (R)	1	CMAY2Z334
26	FK28R–11	SPRING SLIDE	1	
29	FR22D–11	ASSY FLYWHEEL	1	
30	FR22E–13	ASSY FLYWHEEL	1	
31	FR20L–21A	ASSY PINCH ROLLER (R)	1	
32	FR20M–22	ASSY PINCH ROLLER (L)	1	
36	FG114–14	SCREW	2	
37	UG15S–11A	SCREW	1	
39	UG13U–15	E-RING	2	
51	F765-263	BLOCK SOLENOID	1	
52	FL39H–12A	IRON CORE	1	

NO.	PARTS NO.	NAME	Q'TY	NOTE
53	FL39K–12	PLUNGER	1	
61	F573–096	BLOCK PLATE HOLD	1	CMAY2Z333
	F573–097			CMAY2Z334
62	FC52R–11	BRACKET DAMPER (R)	1	CMAY2Z333
	FC52N–11	BRACKET DAMPER (L)	1	CMAY2Z334
63	KG194–28	SCREW	4	
70	F684–053	BLOCK DRESSING	1	
71	UG12T–11	SCREW	1	

PLAYBACK DECK(A) CMAY 2Z334A



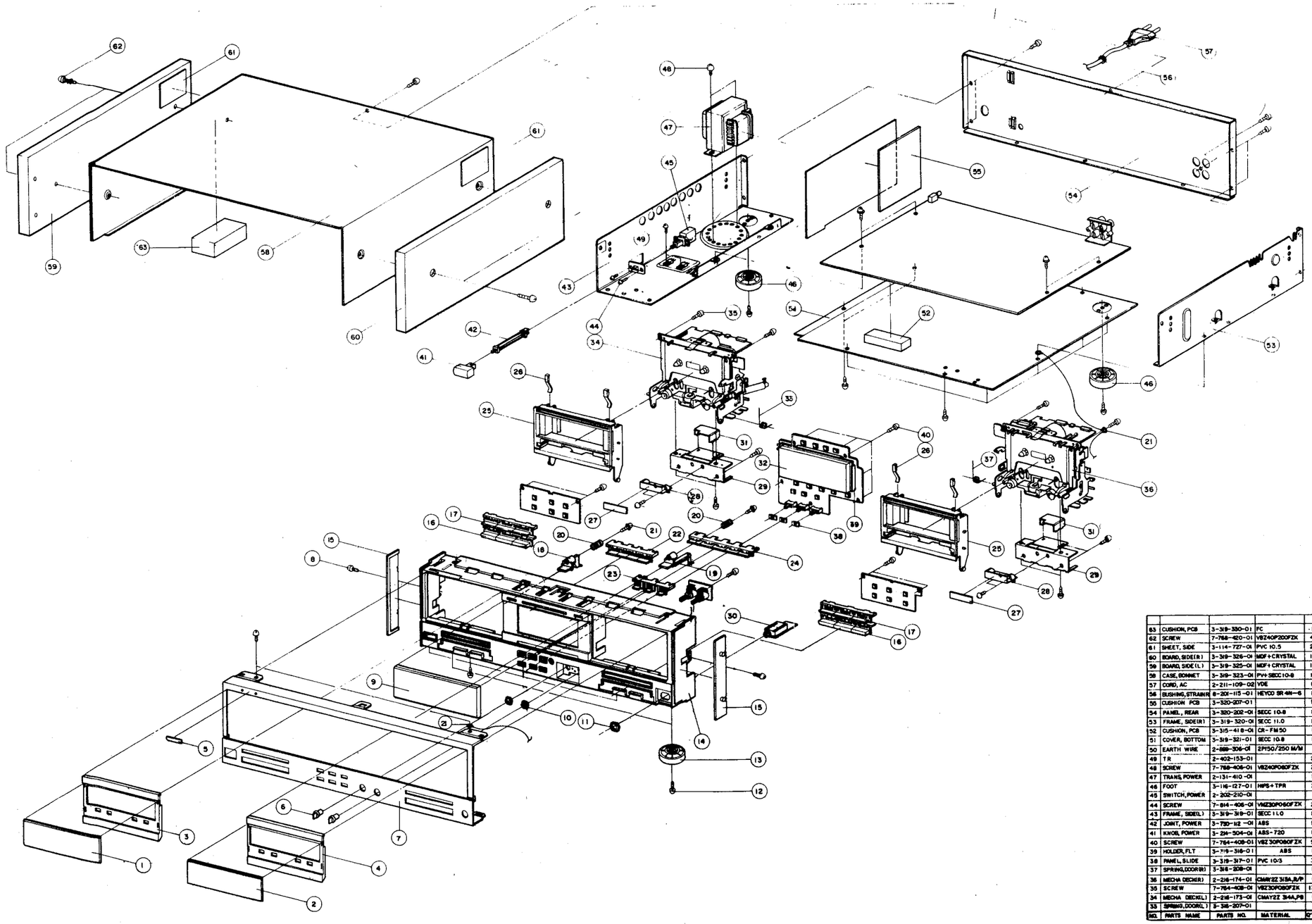
REC/PLAYBACK DECK(B) CMAY 2Z333A



(A): MOLYKOTE X5 DOW CORNING CO..LTD

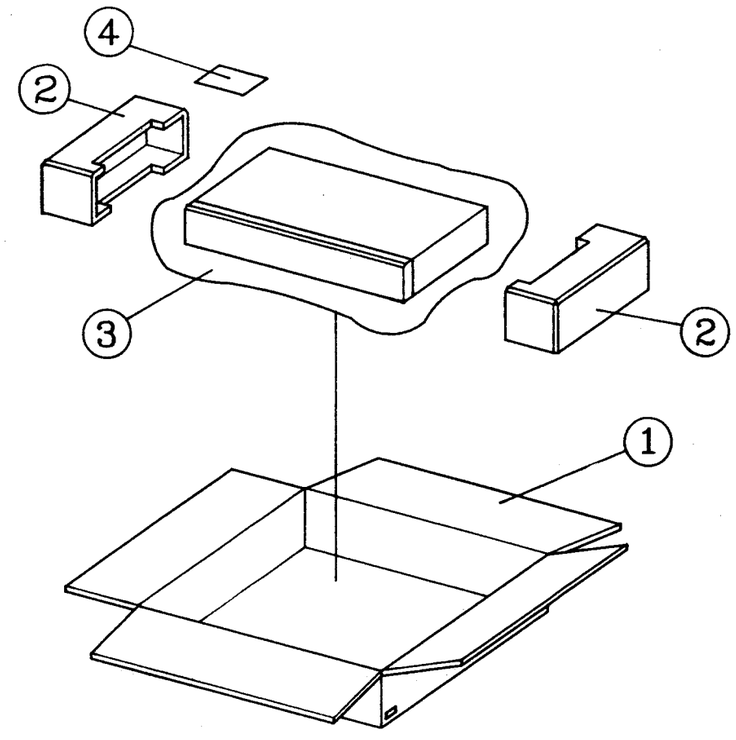
(B): SCREW LOCK THREE BOND CO..LTD

EXPLODED VIEW



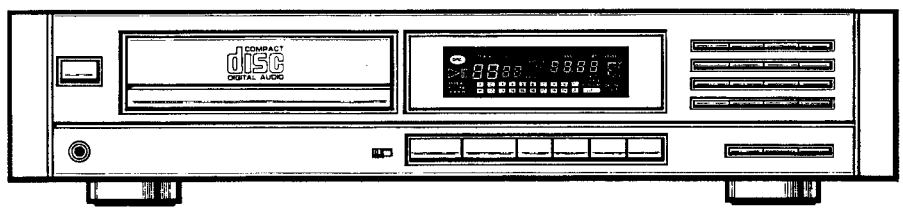
63	CUSHION, PCB	3-319-330-01	FC	1	32	FLT	2-143-240-01	1
62	SCREW	7-766-420-01	VBZ40P200FZK	4	31	PLATE, SHIELD(A)	3-316-732-01	SPTE 10.3 2
61	SHEET, SIDE	3-114-727-01	PVC 10.5	2	30	JACK, HEAD PHONE	2-155-600-01	SCJ 0639-1-0 1
60	BOARD, SIDE(R)	3-319-326-01	MDF+CRYSTAL	1	29	BRK'T, GUIDE	3-319-318-01	SECC 11.0 2
59	BOARD, SIDE(L)	3-319-325-01	MDF+CRYSTAL	1	28	CASE, SHIELD	3-316-720-01	SPTE 10.3 2
58	CASE, BONNET	3-319-323-01	PVH-SECC 10-8	1	27	PANEL, SHIELD	3-316-731-01	PVC 10.3 2
57	CORD, AC	2-211-109-02	VDE	1	26	SPRING, HALF RNE.	3-312-728-02	SUS-304 4
56	BUSHING, STRAIN	8-201-115-01	HEYCO SR 4N-6	1	25	HOLDER, CASSETTE	3-316-204-02	ABS-750 2
55	CUSHION PCB	3-320-207-01		1	24	KNOB, TACT(E)	3-319-315-01	ABS-720 1
54	PANEL, REAR	3-320-202-01	SECC 10-8	1	23	KNOB, TACT(C)	8-319-313-01	ABS-720 1
53	FRAME, SIDE(R)	3-319-320-01	SECC 11.0	1	22	KNOB, TACT(D)	3-319-314-01	ABS-720 1
52	CUSHION, PCB	3-315-418-01	CR-FM 50	1	21	SCREW	7-544-409-01	ATZ30P080FZK 6
51	COVER, BOTTOM	3-319-321-01	SECC 10.8	1	20	SPRING, EJECT	3-316-213-01	SUS-304 BD.5 2
50	EARTH WIRE	2-889-306-01	2P150/250 M/M	1	19	KNOB, EJECT(R)	3-319-310-01	ABS-720 1
49	TR	2-402-153-01		2	18	KNOB, EJECT(L)	3-319-309-01	ABS-720 1
48	SCREW	7-768-406-01	VBZ40P080FZK	2	17	KNOB, TACT(A)	3-319-311-01	ABS-720 2
47	TRANS, POWER	2-131-410-01		1	16	KNOB, TACT(B)	3-319-312-01	ABS-720 2
46	FOOT	3-116-127-01	HIPS+TPR	2	15	PLATE, DECORATION	3-114-717-01	ABS-710, GOLD 2
45	SWITCH, POWER	2-202-210-01		1	14	PANEL, BASE	3-319-303-01	ABS-720 1
44	SCREW	7-814-406-01	VBZ30P060FZK	2	13	FOOT ASS'Y	3-842-465-01	HIPS+TPR, GOLD 2
43	FRAME, SIDE(L)	3-319-319-01	SECC 11.0	1	12	SCREW	7-764-410-01	VBZ30P100FZK 9
42	JOINT, POWER	3-730-112-01	ABS	1	11	NUT	7-113-120-01	NC130FNI 1
41	KNOB, POWER	3-234-504-01	ABS-720	1	10	NUT	7-116-070-02	NK70FNC 2
40	SCREW	7-764-408-01	VBZ30P080FZK	9	9	WINDOW, FLT	3-319-308-01	ACRYL 1.3 1
39	HOLDER, FLT	3-319-316-01	ABS	1	8	SCREW	7-764-406-01	VBZ30P060FZK 22
38	PANEL, SLIDE	3-319-317-01	PVC 10.3	3	7	PANEL, FRONT	3-320-201-01	A-6083-T5 1
37	SPRING, DOOR(R)	3-316-209-01		1	6	KNOB, ROTARY	3-319-306-01	ABS-720 2
36	MECHA DECK(R)	2-216-174-01	CMAY2Z 318A, B/P	1	5	BADGE	3-218-102-01	AL 1
35	SCREW	7-764-409-01	VBZ30P080FZK	13	4	BASE, DOOR (R)	3-319-305-01	ABS-720 1
34	MECHA DECK(L)	2-216-173-01	CMAY2Z 344A, P8	1	3	BASE, DOOR (L)	3-319-304-01	ABS-720 1
33	SPRING, DOOR(L)	3-316-207-01		1	2	WINDOW, DOOR(R)	3-319-307-01	ACRYL 12.0 1
				1	1	WINDOW, DOOR(L)	3-319-308-01	ACRYL 12.0 1
NO.	PARTS NAME	PARTS NO.	MATERIAL	Q'TY	NO.	PARTS NAME	PARTS NO.	MATERIAL Q'TY

PACKING



NO	PARTS NUMBER	DESCRIPTION	Q'TY
1	3-320-203-01	PACKING CASE	1
2	3-319-327-01	SIDE PAD	2
3	3-415-046-01	POLY SHEET	1
4	3-320-204-01	OPERATING MANUAL	1
5			
6			

SERVICE MANUAL



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SPECIFICATIONS

AUDIO

Number of Channels	2
Frequency Response	20Hz-20KHz
Signal to noise ratio	100 dB
Channel Separation	90dB
Distortion	0.01% (1KHz)
Wow & Flutter	Quartz Crystal Precision

DISC

Diameter	120mm (4–3/4) 500-200rpm (inside–outside)
Tracking Pitch	1.6μm
Playing Time	60min
Tracking System	Non-contact

SIGNAL FORMAT

Sampling Frequency	44.1 KHz
Quantization	18 bit Dual D/A Converter
Bit rate	4.3218Mb/sec
Filter	8 Times over Sampling

GENERAL

Power	230V AC 50Hz
Power Consumption	12W
Dimensions (WxHxD)	460x100x300 mm
Weight-player only	5.0 Kg

PRECAUTIONS

Do Not Open the Cabinet

If the cabinet is opened, you may be exposed to dangerously high voltages. Never open the cabinet under any circumstances.

Do Not Touch the Pickup Lens

The pickup — the heart of the Disc player — is located inside of the disc tray opening. To avoid dust collecting on the pickup, do not leave the tray open for long periods.

If the lens becomes dirty, clean it with a soft brust or use on air blower brush designed for camera lenses.

Do Not Touch the Player with Wet Hands

Do not handle the player or power cord when your hands are wet or damp. If water or any other lipuid enters the player cabinet, take the player to an authorized service center for inspection.

Laser Product Safety

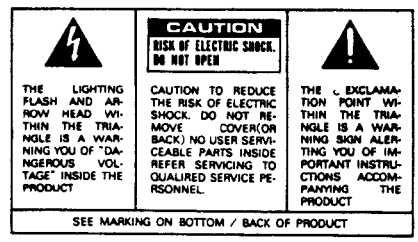
This Compact Disc Player uses a laser to "read" the music on the disc. The laser mechanism corresponds to the cartridge and stylus of a traditional record player. Although this product is completely safe when operated according to directions, you should understand that lasers can emit hazardous radiation and can cause damage to eyes if handled improperly.

WARNING

NEVER OPERATE THIS PRODUCT WITH THE CABINET REMOVED.

Any repairs or internal adjustments should be made only by a trained repairman.

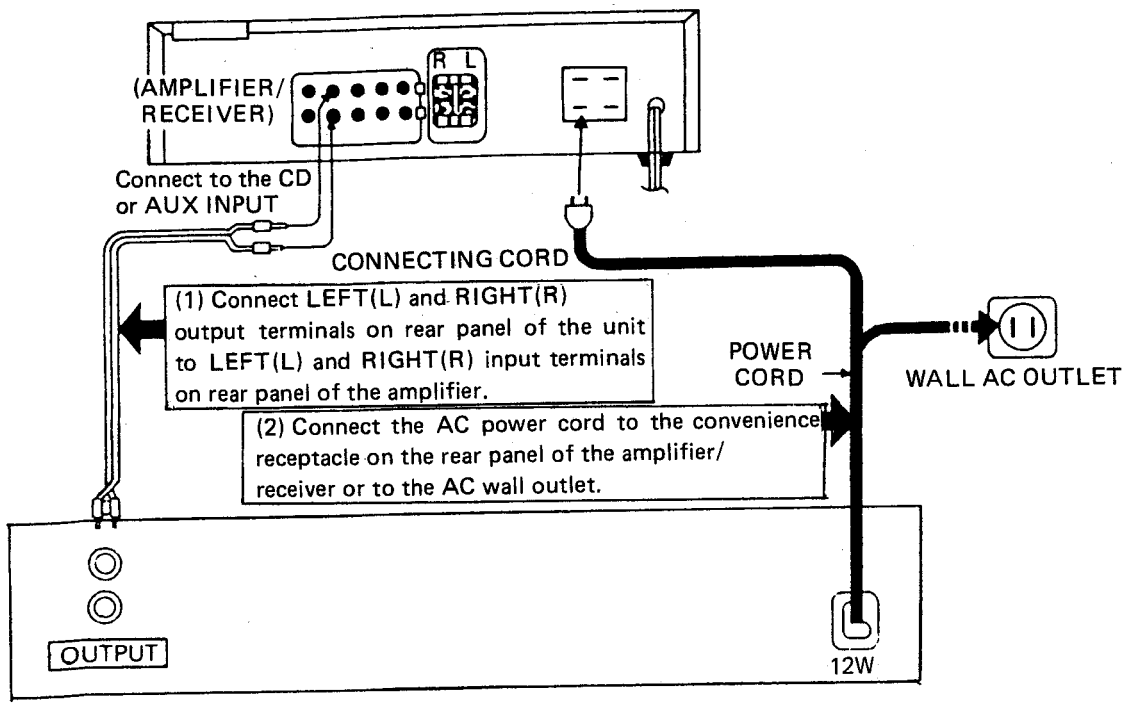
CAUTION Used of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.


THE LIGHTING FLASH AND ARROW HEAD WITHIN THE TRIANGLE IS A WARNING YOU OF "DANGEROUS VOLTAGE" INSIDE THE PRODUCT
CAUTION
RISK OF ELECTRIC SHOCK. DO NOT OPEN
CAUTION TO REDUCE THE RISK OF ELECTRIC SHOCK. DO NOT REMOVE COVER(OR BACK) NO USER SERVICEABLE PARTS INSIDE REFER SERVICING TO QUALIRED SERVICE PERSONNEL.
THE EXCLAMATION POINT WITHIN THE TRIANGLE IS A WARNING SIGN ALERTING YOU OF IMPORTANT INSTRUCTIONS ACCOMPANYING THE PRODUCT
SEE MARKING ON BOTTOM / BACK OF PRODUCT

WARNING: To prevent fire or electric shock hazard, do not expose this product to rain or moisture.

CONNECTIONS

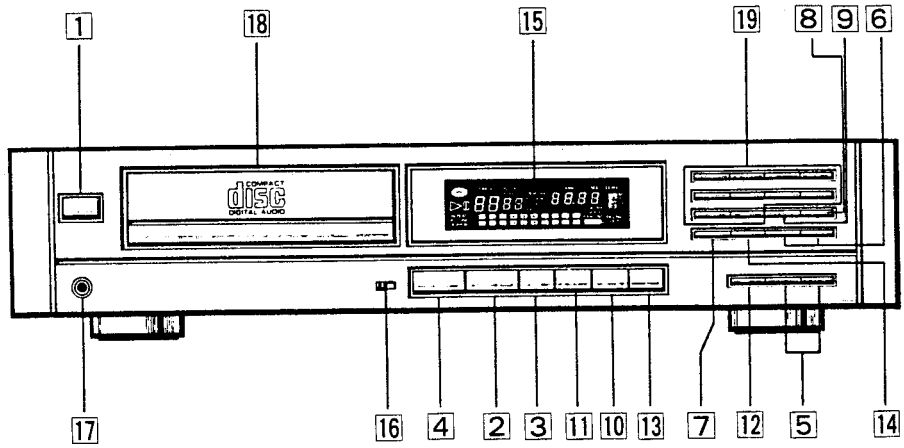
"**WARNING** . Do not connect this compact disc player to the phono jacks on your amplifier/receiver."


(AMPLIFIER/
RECEIVER)
R L
Connect to the CD
or AUX INPUT
CONNECTING CORD
(1) Connect LEFT(L) and RIGHT(R) output terminals on rear panel of the unit to LEFT(L) and RIGHT(R) input terminals on rear panel of the amplifier.
POWER
CORD
WALL AC OUTLET
(2) Connect the AC power cord to the convenience receptacle on the rear panel of the amplifier/ receiver or to the AC wall outlet.
OUTPUT
12W

NOTE

- When installing or removing the connecting cord. The CD player should be turned off.
- Be sure to connect the player's left and right output to the left and right input (AUX. CD) on the amplifier/receiver.
- Insert connections completely to ensure proper operation.

FRONT PANEL CONTROLS AND FUNCTION



1. Power

Press to turn power to the unit on and off.

2. Play/Pause:

If the play/pause button is pressed while the "CD" is in stop mode, the "CD" shall begin playing from the beginning of the selected track.

If the play/pause button is pressed while the "CD" is in the play mode, "CD" will enter the "Pause" mode, i.e.; the disc will continue to turn, but laser pick up is inactive, and the play time indicator on VFD will flash.

When the button is again pressed while the "CD" resumes at the point where it was stopped.

3. Stop

Pressing the stop button while the "CD" is in any mode returns the "CD" to the stop mode, and all functions are reset to their power up condition.

4. Open/Close:

When the disc tray is closed, the tray will open by pressing the button.

Pressing the button while the "CD" is in any mode return the "CD" to the stop mode, opens the tray, and all functions are reset to their power up conditions.

5. Track skip ▶▶| |◀◀

Two buttons, one for forward and one for reverse.

- **forward ▶▶|**

  Pressing the track forward button while "CD" is in the pause or play mode will advance the track counter one number in the appropriate direction, and prepare to play from the beginning of that track.

- **reverse |◀◀**

  Pressing track reverse button while the "CD" is in the pause or play mode will decrement the track counter one number in the appropriate direction, and prepare to play from the beginning of that track.

6. Track search ▶▶ ◀◀

- **forward search ▶▶**

  When this button is pressed, the pick up will move in the forword direction at twice normal speed.

- **reverse search ◀◀**

  When this button pressed, the pick up will move in the reverse direction at twice normal speed.

7. Program

The program button will allow one to program the play sequence up to 24 tracks in any order desired then stop or repeat.

Insert CD, in stop mode.

Press the memory button. The VFD will indicate the memory mode.

Press the track forward or reverse buttons to the track desired.
Press "memory" key to enter this selection into the memory.
Sequence memory will save upto 24 tracks.
To play the sequence entered, press the play button. Play will start from the first selection and "memory" will be displayed on the VFD. Any repeat functions can be selected at this time.

8. Repeat (A–B)

This plays repeatedly between two points on a track.
During play mode, press once at the beginning of a section of the track you wish to repeat(Point A). Next, press again at the end of the section or track you wish to repeat(Point B). The player plays repeatedly from A to B.
Press again to clear this function.

9. Repeat (1/ALL)

The repeat key shall scroll through Off-Repeat One-Repeat all when it is pressed.
In the repeat all mode, when the last track of the disc has completed playing, the laser pick up returns to the beginning of the first track and play resumes.
In the "Repeat one" mode, the CD will simply repeat the current track played continuously.
In the "Repeat off" mode, at the end of the last track the "CD" returns to the stop mode.
"The repeat All" or "Repeat track" are indicated on the VFD.

10. Random

Select a track randomly and play until all the tracks are played.

11. Intro

By pressing this button, 10 seconds of each track shall be played, this mode will be cancelled if the key is pressed again.

12. Display

The display sequence is as follows:
Play time → Remaining time/all → Remaining time/track

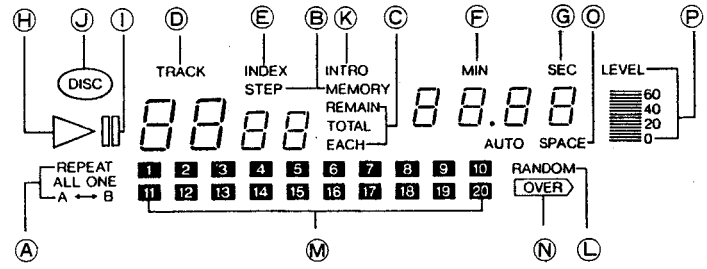
13. Auto space

Press this button to insert a silent interval of 5 seconds after each track on the disc has been played. To canceal this status, press this button once again.

14. Clear

When the unit is in the memory mode, all the programs in the memory will be erased if this key is pressed

15. Multi display



Ⓐ **REPEAT INDICATOR**
REPEAT ONE : lights during one track repeat play
REPEAT ALL : lights during all track repeat play
REPEAT A–B :
lights during playing repeatedly between two points on the disc

Ⓑ **MEMORY INDICATOR**
STEP MEMORY:
lights when "PROGRAM" button press to memorize program step
MEMORY:
lights during program play

Ⓒ **REMAIN INDICATOR**
EACH:
lights when the display shows the number of the current tracks and playing time
REMAIN TOTAL :
lights when the display shows the total remaining time
REMAIN EACH :
lights when the display shows the each remaining time

Ⓓ **TRACK INDICATOR**
TRACK :
indicates the disc "track NO." during disc play

Ⓔ **INDEX INDICATOR**
INDEX:
indicates the disc "index NO." during disc play

Ⓕ **MIN. INDICATOR**
MIN:
indicates elapsed time "min" during disc play

Ⓖ **SEC. INDICATOR**
SEC:
indicates elapsed time "sec" during disc play

Ⓗ **PLAY INDICATOR**
: lights during normal disc play or programmed play

Ⓘ **PAUSE INDICATOR**
: lights when the player is in the pause mode

Ⓙ **DISC INDICATOR**
DISC: lights when disc is loaded

Ⓚ **INTRO INDICATOR**
INTRO: lights during intro play

Ⓛ **RANDOM INDICATOR**
RANDOM: lights during random play

Ⓜ **TRACK CALENDER INDICATOR**
1 - - - 20: indicates total numbers of track on the disc

Ⓝ **OVER INDICATOR**
OVER:
lights when the tracks on the disc cannot be displayed more than 20 tracks.

AUTO SPACE
Light when the auto space function is activated by the auto space button

Ⓟ **LEVEL METER**
Indicates audio output level during playing.

16. Auto play
Turn on this switch for auto play operation. When power button is pressed, Disc playing start automatically after TOC(Table Of Contents) reading.

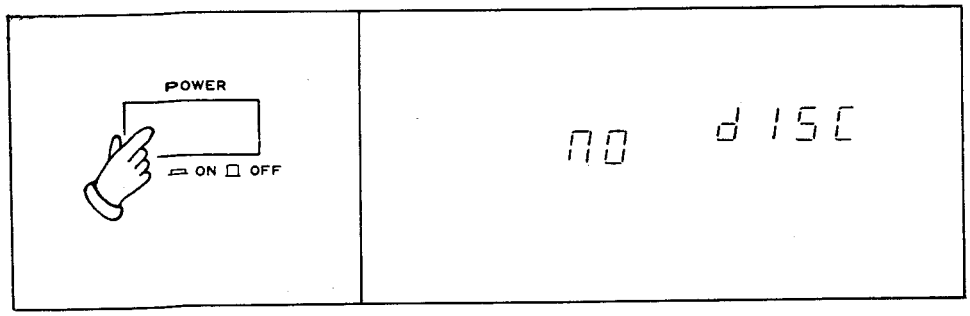
17. Headphone jack

18. Disc tray

19. Number key (0-9)
Use these keys for program memory or direct music search.

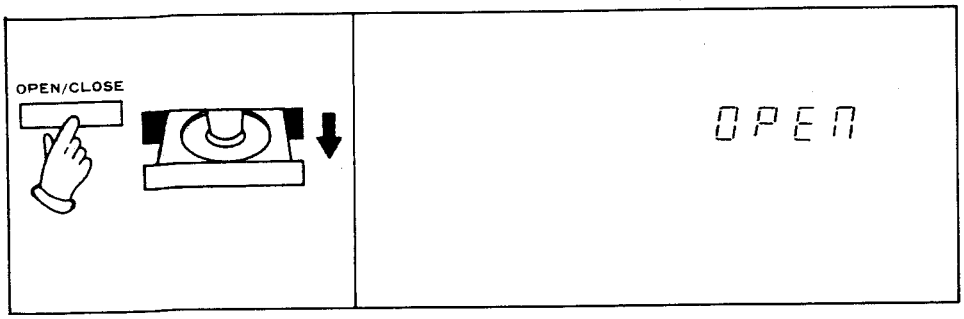
PLAYING A DISC

LOADING AND PLAYING A DISC

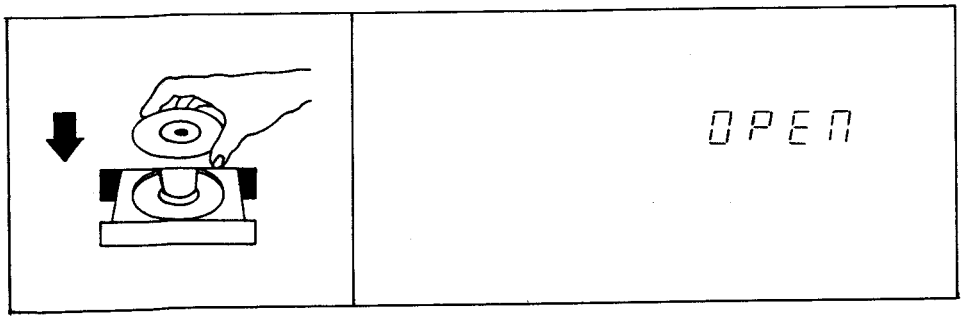


Press the switch to set the power to ON.

To switch the power off, press the POWER again.

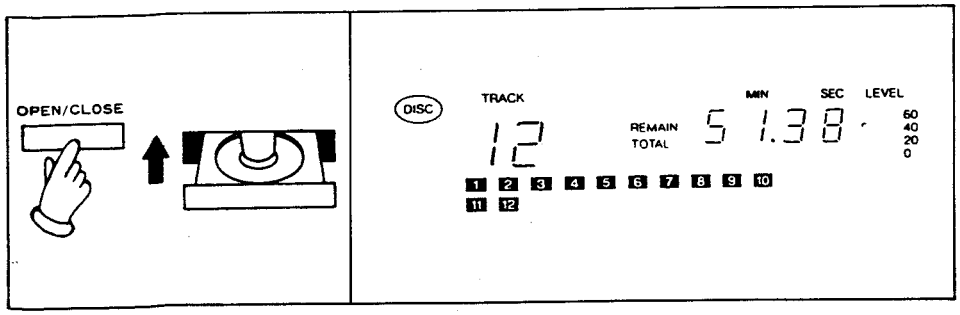


Press OPEN/CLOSE to open the disc tray.



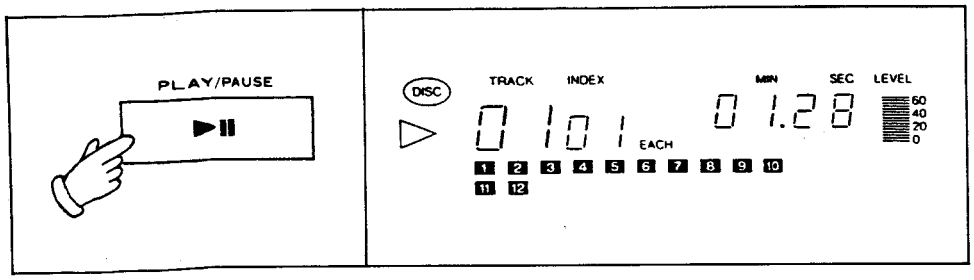
Load the disc, label facing up.

Place the disc correctly in the disc holder.

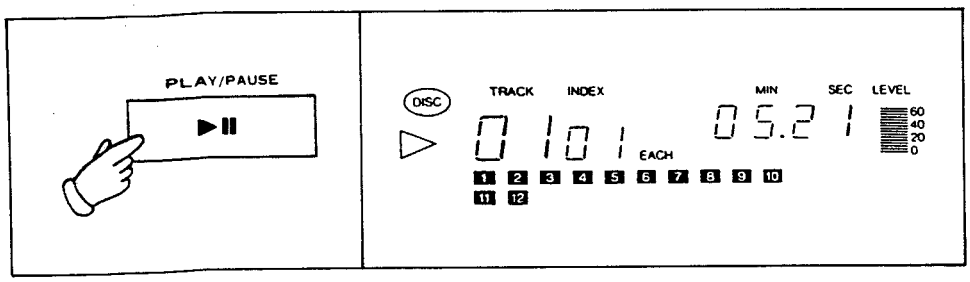


Press OPEN/CLOSE to close the disc tray.

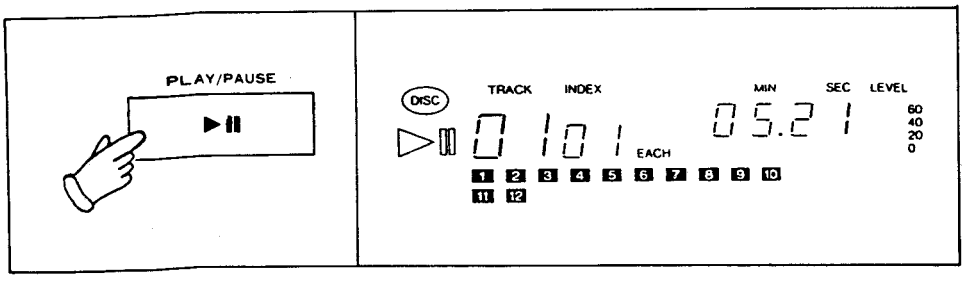
NOTE: If the disc is inserted incorrectly, it could damage the disc and/or the players. Always place the disc with the label.



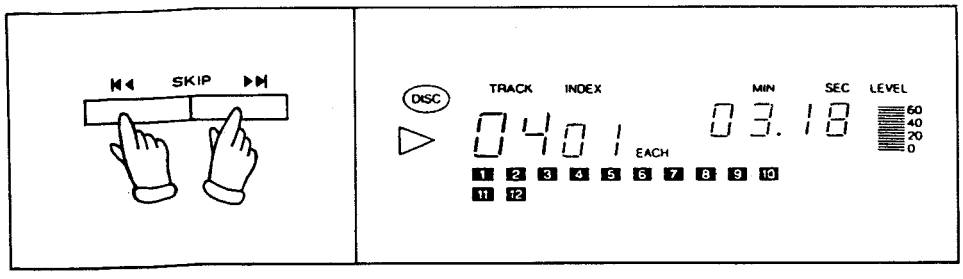
Press PLAY/PAUSE to play the disc from beginning.



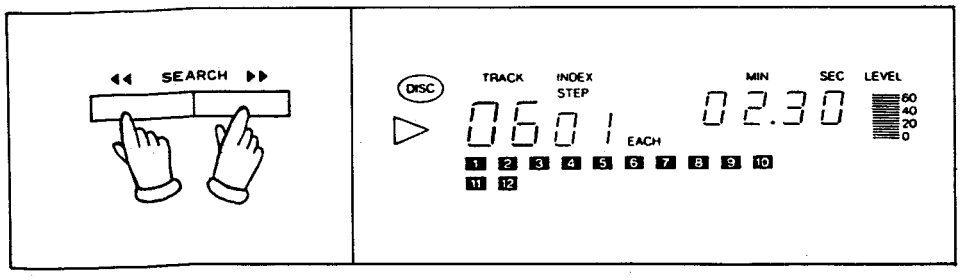
To momentarily stop playing, press PAUSE.



To resume the disc play again, press PLAY/PAUSE.



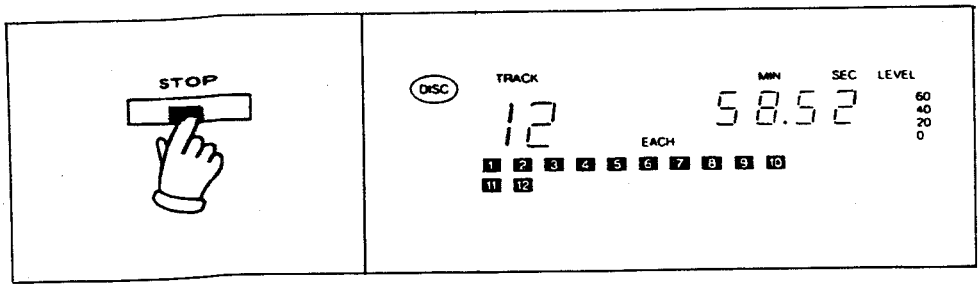
To move rapidly to another track, press SKIP.



To move rapidly within the same track, prees SEARCH.

To start PLAY from a particular selection on the disc, press the SKIP forward button. When the selection number you desire appears in the display, press the PLAY/PAUSE.

During PLAY, pressing the SKIP reverse button will return PLAY to the beginning of the selection being played. Press again to SKIP back to the beginning of the previous selection.



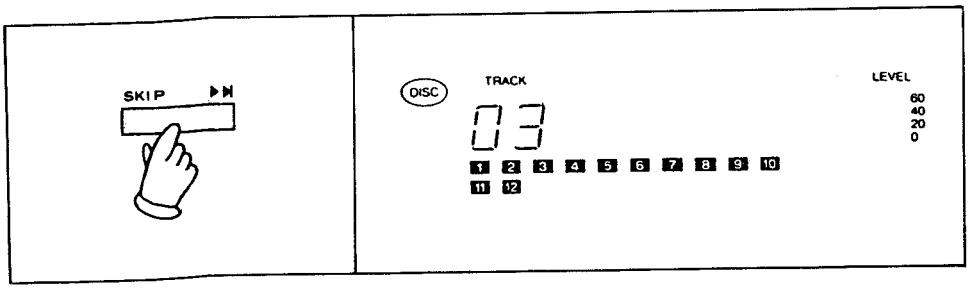
To stop playing, press STOP.

MEMORY

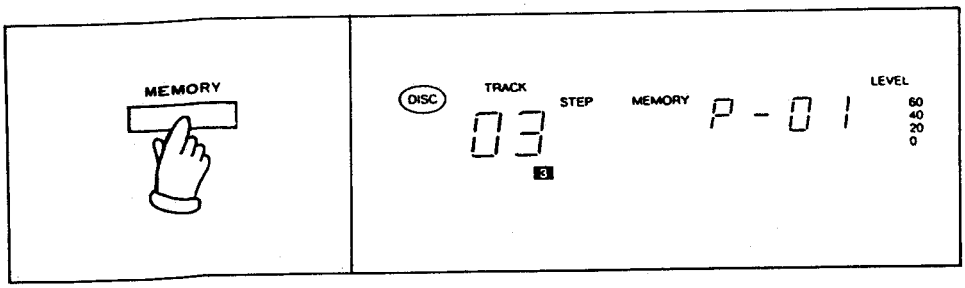
1. MEMORY PROCEDURE

The MEMORY feature permits you to change the order in the order in which the various selections on the disc are played. You can also select to play only a few or all of the selections, up to a total of 24.

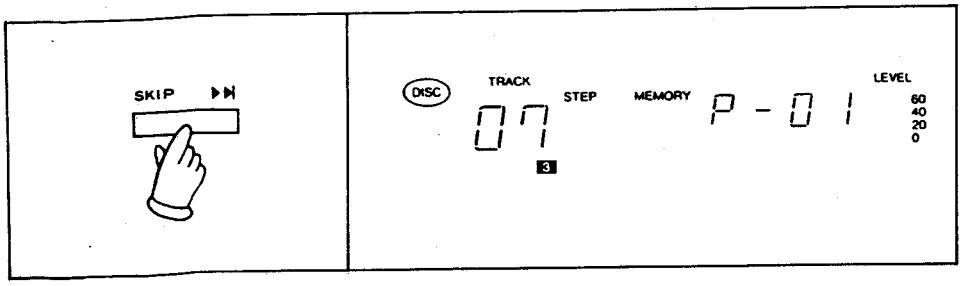
You can program during STOP mode.



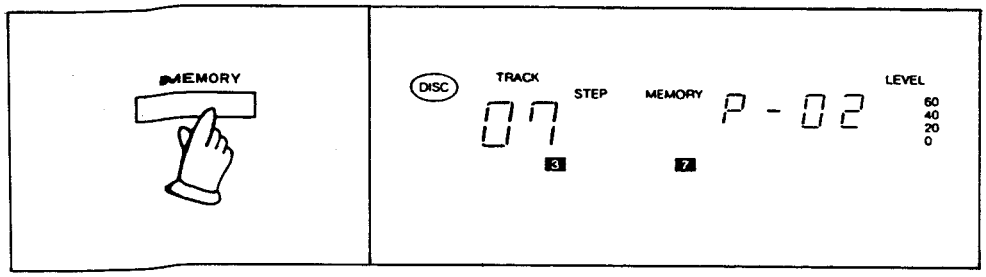
Press SKIP 3 times if you want track no.3 to be played as the first memory



Press MEMORY to memorized the first program step.

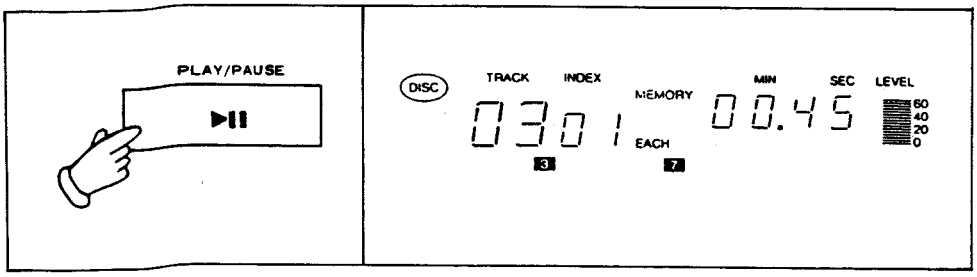


To move rapidly to another track, press SKIP.



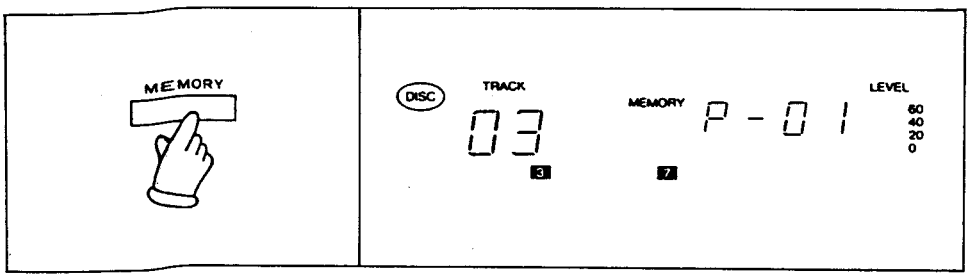
Press MEMORY to memorize second memory step.

Repeat the same process to memorize other memory step.

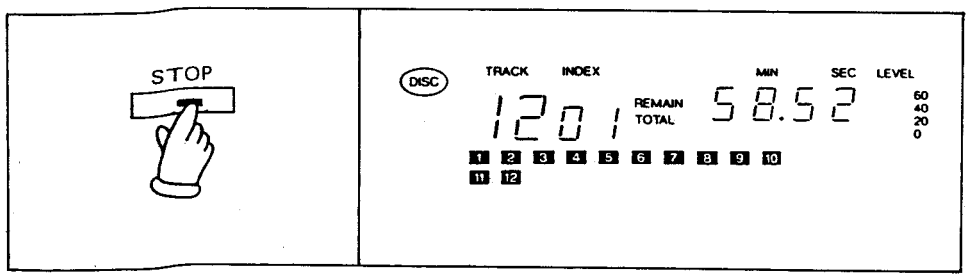


To start play in your memory order, press PLAY/PAUSE.

2. MEMORY CLEAR



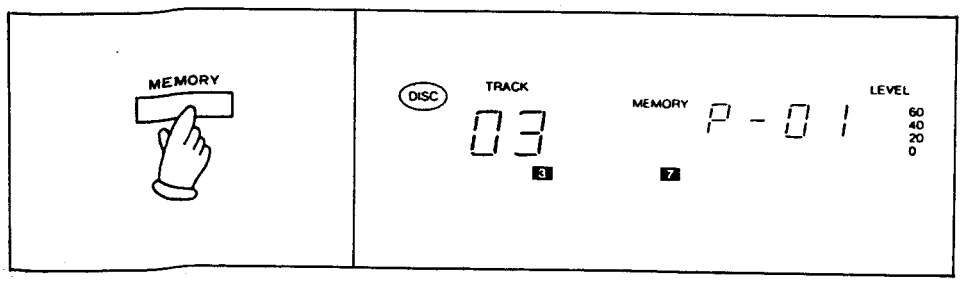
During stop mode, press MEMORY to indicate memory mode.



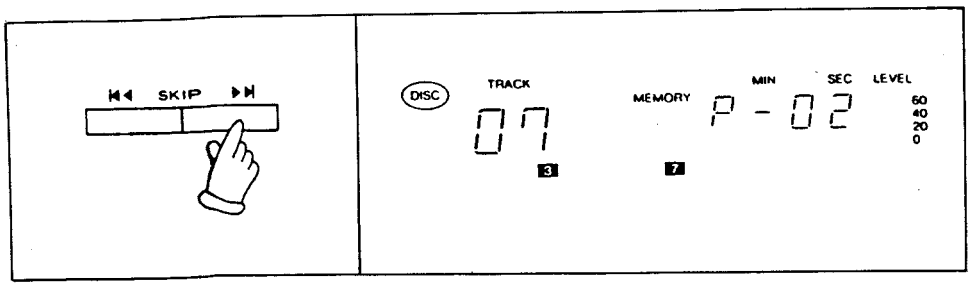
Press "CLEAR BUTTON" to erase the memorized content.

Memorized play is automatically clear when power is switched off and OPEN/CLOSE press.

3. MEMORY RECALL



During stop mode, press MEMORY to indicate memory mode, then the first memorized track shows.

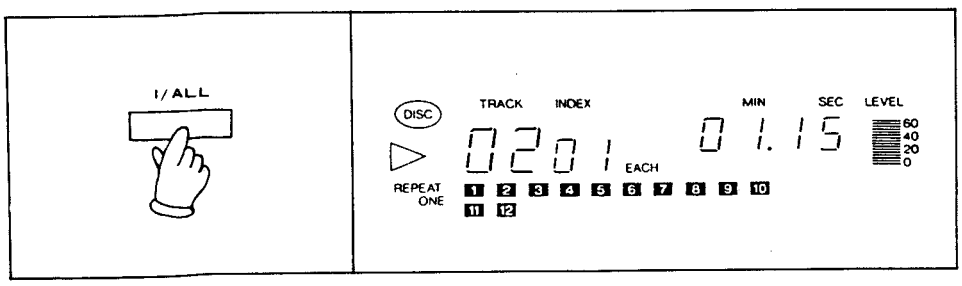


To check the memorized tracks, repeatdly press SKIP.

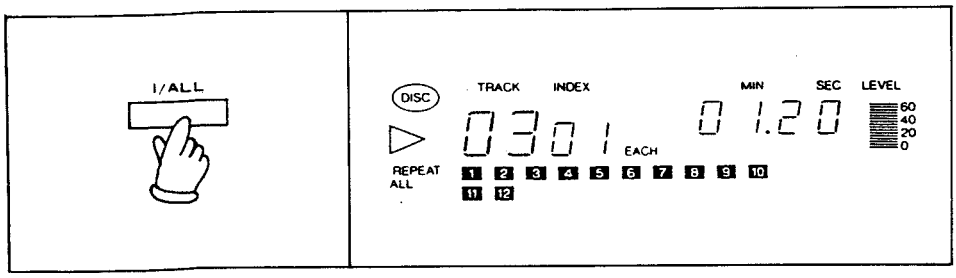
The display shows the number of each memorized track in sequence.

REPEAT PLAY

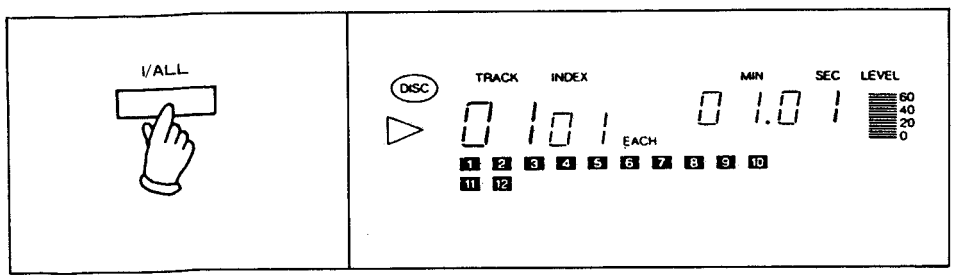
1. ONE/ALL REPEAT PLAY



During playing, for repeated play of the displayed track (selection), press REPEAT once.



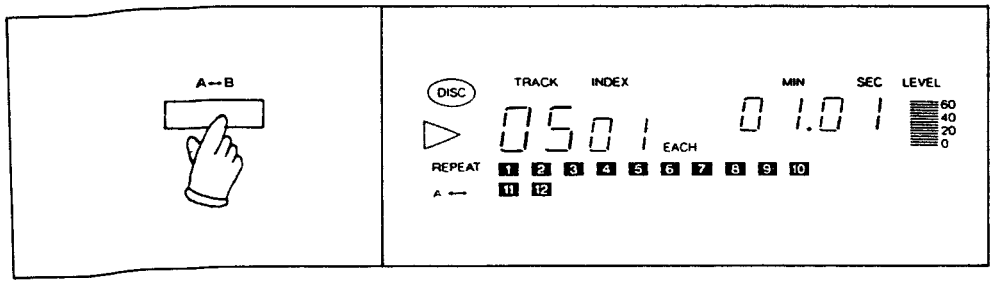
For repeated play of the entire disc, press REPEAT twice.
"ALL" appears in the display.



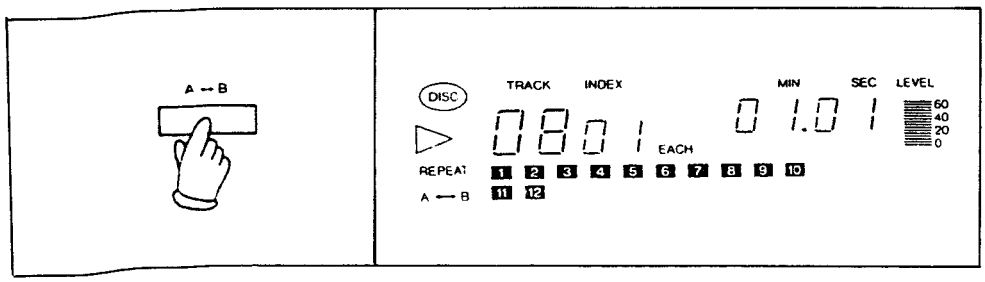
To canceal repeat play, press REPEAT until REPEAT indicator disappears from the display.

2. A–B REPEAT PLAY

This funtion plays repeatedly between two points on a track.



During play mode, press once at the beginning of the section of the track you wish to repeat (point A).

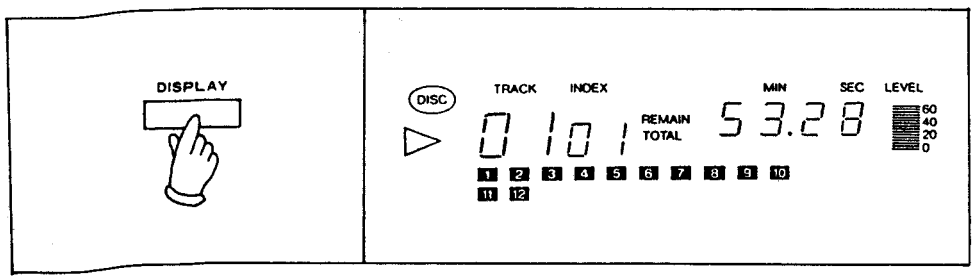


Press again at the end of the section or track you wish to repeat(point B).
The player plays repeatedly from A to B.

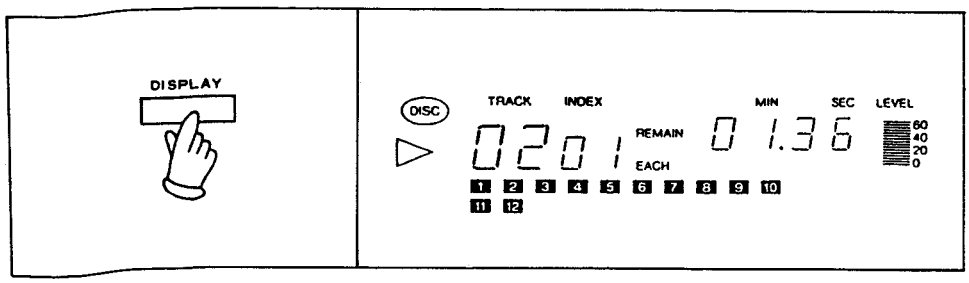
Press again to clear this button.

DISPLAY SELECTION

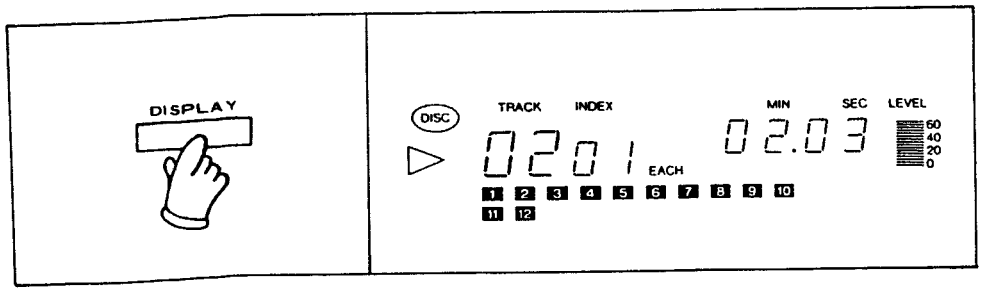
During the play or pause mode, press this button to change the indications on the display.
(TOTAL REMAIN TIME, EACH REMAIN TIME, EACH TIME)



When the DISPLAY BUTTON is pressed once, this display will show the total remaining playing time of the disc in minutes and seconds.

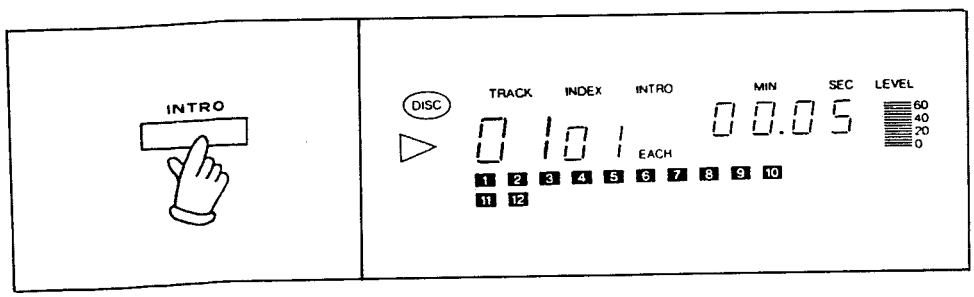


When the DISPLAY BUTTON TIME is pressed twice, this display will show the each remaining playing time of the disc in minutes and seconds.



When the DISPLAY BUTTON TIME is pressed again, the display will show the each track playing time of the disc in minutes and seconds.

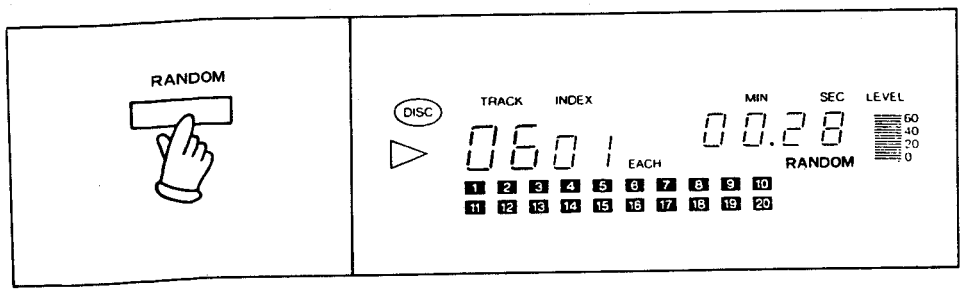
INTRO SCAN PLAY



When INTRO is pressed during the stop mode, the first track on disc will be played for about 10 seconds, then the second track on disc will be played for about 10 seconds.

Intro play will continue in this way until all the tracks on disc have been scanned.

RANDOM PLAY



When you press RANDOM the player plays random tracks, indipendently of their order on the disc.

Press again to cancel random mode.

HANDLING DISCS

CARE OF DISCS

- With this CD player, use discs which display the mark shown.

COMPACT disc DIGITAL AUDIO

- When holding discs, do not touch their signal surfaces. Hold the edges or one edge and the center of the hole.

- Do not affix labels or adhesive tape to the label surfaces. Also do not scratch or damage the label.

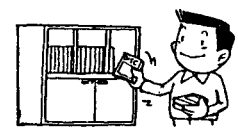
- Discs rotate at high speed inside the player. Do not use damaged (cracked or warped) discs.

CLEANING DISCS

- The presence of finger prints or smudges on the surface of the disc will not directly affect the recorded signals, but depending on the degree of contamination, the brightness of the light reflected from the signal surfaces may be reduced, causing degradation of sound quality. Always keep your disc clean by wiping them gently with a soft cloth from the inner edge toward the outer perimeter.

- If a disc becomes very dirty, wet a soft cloth in water. After wrining out well, wipe the dirt away gently, and then remove any water drops with another dry cloth.
- Do not use record cleaning sprays or anti — static agents on discs. Also, never clean discs with benzene, thinner, or other volatile solvents which may cause damage to the disc surface.

STORING DISCS



- Discs are made of the same kinds of plastic used for conventional records. Be careful not to allow discs to warp; always store them in their cases, vertically, avoiding locations with high heat or humidity, or extremely low temperatures.

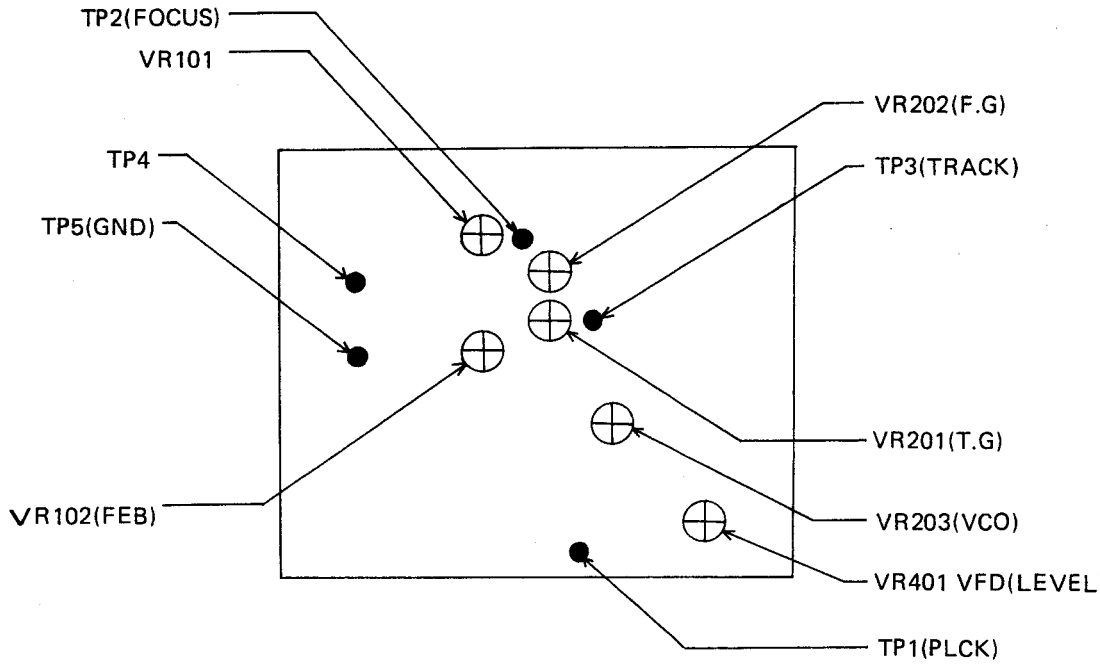
TROUBLESHOOTING GUIDE

With proper care and handing, your CD player should give you years of trouble–free service. If you do have problems try the remedies suggested in the following chart. If you still have problems take the player to your dealer for servicing.

Problem	Possible Cause	Remedy
Power is turned on but no indicators.	Check for unplugged power cord.	Plug AC cord into a standard AC outlet.
CD is loaded but display does not show total number of tracks and total play time	1. CD is loaded upside down. 2. CD is dirty or scratched. 3. CD is not a standard Compact Disc.	1. Reload CD with label side up. 2. Clean CD or try a different disc. 3. Be sure that CD bears the standard Compact Disc logo.
No sound.	Audio cable defective or not connected.	Replace cables. Be sure that they are properly plugged into the correct input jacks.
intermittent sound or the same part is repeated	1. CD is scartched. 2. CD is dirty.	1. Replace CD 2. Clean CD–Refer to "Care and Maintenance."

ADJUSTMENT

1. ADJUSTMENT POINT



2. ADJUSTMENT PROCEDURE

1) VCO ADJUSTMENT

PURPOSE: To adjust the EFM decoder reference clock free run frequency to a suitable value.

MALADJUSTMENT SYMPTOMS: Spindle lock not possible, distorted or no sound at all.

- Connect a frequency counter to test pins TP1 (PLCK) and TP5(GND), and turn on the power.
- Adjust VR203 (VCO) to obtain a frequency of 5.1MHz.

2) FOCUS OFFSET ADJUSTMENT

PURPOSE: To adjust the electrical offset of the focus amplifire to zero.

MALADJUSTMENT SYMPTOMS: No focus closing.

- Connect an oscilloscope or DC voltmeter to test points TP2 (FOCUS) and TP5 (GND).
- Adjust VR102 (FOCUS OFFSET) to abtain DC voltage ±1mv.

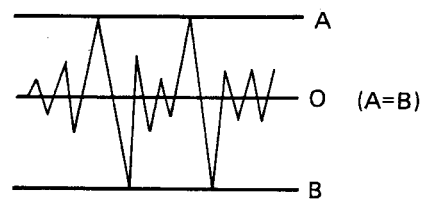
3) TRACKING BALANCE ADJUSTMENT

PURPOSE: To adjust the tracking servo offset to zero.

MALADJUSTMENT SYMPTOMS: Search times too long, poor playability, carriage run–away.

- Connect an oscilloscope to test points TP3 (TRACKING) and TP5 (GND).
- Turn on the power and load the test disc in the disc tray, and push the play button.
- Press continuously the track search button (▶▶).
- Using an oscilloscope, observe the tracking error signal.

  During track search, adjust VR102 (TRACKING BALANCE) to set the positive and negative amplitudes to the same levels as shown below.



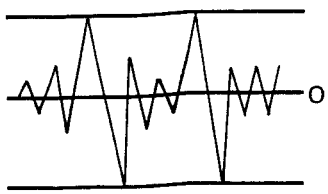
oscilloscope 200 mv/div.
1 msec/div.

4) TRACKING GAIN ADJUSTMENT

PURPOSE: To adjust the tracking servo loop gain to an optimum value.

MALADJUSTMENT SYMPTOMS: Poor playability, reduced resistance to vibration.

- Connect an oscilloscope to test points TP3 (TRACKINGS) and TP5 (GND).
- Turn on the power and load the test disc in the disc tray, and push the play button.
- Press continuously the track search button (▶▶)
- Using an oscilloscope, observe the tracking error signal.
  During track search, adjust VR201 (TRACKING GAIN) to obtain the peak voltage of 600 mv ±50 mv as shown below.



Vpp=600mV ± 50mV

oscilloscope 200 mv/div.
1 msec/div.

5) FOCUS GAIN ADJUSTMENT

PURPOSE: To adjust the focus servo loop gain to an optimum value.

MALADJUSTMENT SYMPTOMS: Poor playbility, reduced resistance to vibration, focus closure fails readly.

- Connect an oscilloscope to test points TP2 (FOCUS) and TP5 (GND).
- Turn on the power and load the test disc in the disc tray, and push the play button.
- Using an oscilloscope, observes the focus error signal. During playing, adjust VR202 (FOCUS GAIN) to obtain the focus error voltage of 100 mv ± 10 mv as shown below.

100mV ± 10mV

oscilloscope 100 mv/div.
1 msec/div.

ELECTRICAL PARTS LIST

MAIN PC BOARD ASS'Y

REF NO.	DISCRIPTION	CODE NO.
	IC's	
IC101	CXA 1081M	2-440-410-74
IC201	CXA 1082A	2-440-408-74
IC202	STA 341M	2-442-026-79
IC203	MC 4558C	2-441-236-71
IC301	CXD-1135Q	2-440-409-74
IC302	LE1012 HD 614081	2-600-114-01
IC303	HY 6116 AP-15 S-RAM 1.6K	2-440-931-33
IC304	SM 5840 CP 8 TIME D/F	2-442-029-57
IC305	AD 1864 18 BIT	2-440-210-11
IC401	MC 4558C	2-441-236-71
IC402	MC 4558C	2-441-236-71
IC403	MC 4558C	2-441-236-71
IC405	BA 6138	2-440-330-63
IC406	BA 10393	2-440-324-63
IC501	MC 7805	2-444-218-71
IC502	MC 7905	2-441-232-71
	TRANSISTOR'S	
Q101	KTA 950-Y	2-400-108-25
Q201	KTA 950-Y	2-400-108-25
Q202	MPSA 26	2-402-152-11
Q203	KTC 1815-GR	2-402-111-35
Q204	KTC 2120Y	2-402-114-25
Q205	KTA 950-Y	2-400-108-25
Q206	KTA 1015-GR	2-400-118-35
Q207	KTA 1015-GR	2-400-118-35
Q301	KTC 1815-GR	2-402-111-35
Q404	KTC 1815-GR	2-402-111-35
Q405	KTC 1815-GR	2-402-111-35
Q406	KTA 1015-GR	2-402-118-35
	DIODE'S	
D310	1SS 133	2-410-179-95
D410	1SS 133	2-410-179-95
D501	1N 4003L	2-413-581-65
D502	1N 4003L	2-413-581-65
D503	1N 4003L	2-413-581-65
D504	1N 4003L	2-413-581-65
D505	1N 750A 400 4.7A	2-421-047-31
D506	1N 4003L	2-413-581-65
D507	1N 4003L	2-413-581-65
D508	1N 4003L	2-413-581-65
D509	1N 4003L	2-413-581-65
D510	1N 4003L	2-413-581-65
D511	1N 4003L	2-413-581-65
D512	1N 4003L	2-413-581-65
D513	1N 754A 400 6.85V	2-421-068-41
D514	1SS 133	2-410-179-95
D515	1N 969B 400 22V	2-421-220-31
D516	1N 4003L	2-413-581-65

REF NO.	DISCRIPTION	CODE NO.
	CRYSTAL	
X302	16.9344 MHz	2-138-162-01
	COIL	
L101	AF CHOKE 10μH	2-129-304-01
	VARIABLE RESISTORS	
VR101	6MM (RH0615C) 22K	2-512-223-01
VR102	6MM (RH0615C) 2.2K	2-512-222-01
VR201	6MM (RH0615C) 22K	2-512-223-01
VR202	6MM (RH0615C) 22K	2-512-223-01
VR203	6MM (RH0615C) 2.2K	2-512-222-01
VR401	6MM (RH0615C) 22K	2-512-223-01
	RESISTORS	
R101	100 1/8W 5%	1-118-101-25
R102	22 1/4W 5%	1-114-220-25
R103	10K 1/8W 5%	1-118-103-25
R104	18K 1/8W 5%	1-118-183-25
R105	1.8K 1/8W 5%	1-118-182-25
R106	22K 1/8W 5%	1-118-223-25
R108	100K 1/8W 5%	1-118-104-25
R109	18K 1/8W 5%	1-118-183-25
R110	18K 1/8W 5%	1-118-183-25
R111	1K 1/8W 5%	1-118-102-25
R198	12K 1/4W 5%	1-114-123-25
R199	10K 1/8W 5%	1-118-103-25
R201	4.7K 1/8W 5%	1-118-472-25
R202	4.7K 1/8W 5%	1-118-472-25
R203	75K 1/8W 5%	1-118-753-25
R204	82K 1/8W 5%	1-118-823-25
R205	270K 1/8W 5%	1-118-274-25
R206	33K 1/8W 5%	1-118-333-25
R207	120K 1/8W 5%	1-118-124-25
R208	8.2K 1/8W 5%	1-118-822-25
R209	510K 1/8W 5%	1-118-514-25
R210	100K 1/8W 5%	1-118-104-25
R211	100K 1/8W 5%	1-118-104-25
R212	10K 1/8W 5%	1-118-103-25
R213	10K 1/8W 5%	1-118-103-25
R214	10K 1/8W 5%	1-118-103-25
R215	82K 1/8W 5%	1-118-823-25
R216	10K 1/8W 5%	1-118-103-25
R217	100K 1/8W 5%	1-118-104-25
R217	3.3K 1/8W 5%	1-118-332-25
R218	1M 1/8W 5%	1-118-105-25
R219	22K 1/8W 5%	1-118-223-25
R220	120K 1/8W 5%	1-118-124-25
R221	120K 1/8W 5%	1-118-124-25
R222	100K 1/8W 5%	1-118-104-25
R223	100K 1/8W 5%	1-118-104-25
R224	100K 1/8W 5%	1-118-101-25

REF NO.	DISCRIPTION	CODE NO.
	RESISTORS	
R225	10K 1/8W 5%	1-118-103-25
R226	10K 1/8W 5%	1-118-103-25
R227	100K 1/8W 5%	1-118-104-25
R228	100K 1/8W 5%	1-118-104-25
R301	1M 1/8W 5%	1-118-105-25
R305	47K 1/8W 5%	1-118-473-25
R306	47K 1/8W 5%	1-118-473-25
R310	100 1/8W 5%	1-118-101-25
R336	2.2K 1/8W 5%	1-118-222-25
R337	12K 1/8W 5%	1-118-123-25
R339	68K 1/8W 5%	1-118-683-25
R340	47K 1/8W 5%	1-118-473-25
R341	47K 1/8W 5%	1-118-473-25
R342	47K 1/8W 5%	1-118-473-25
R401	62K 1/8W 5%	1-118-623-25
R402	62K 1/8W 5%	1-118-623-25
R403	82K 1/8W 5%	1-118-823-25
R404	82K 1/8W 5%	1-118-823-25
R405	62K 1/8W 5%	1-118-623-25
R406	62K 1/8W 5%	1-118-623-25
R413	2.4K 1/8W 5%	1-118-242-25
R414	2.4K 1/8W 5%	1-118-242-25
R422	1.2K 1/8W 5%	1-118-122-25
R424	1.2K 1/8W 5%	1-118-122-25
R425	1.2K 1/8W 5%	1-118-122-25
R426	1.2K 1/8W 5%	1-118-122-25
R428	22K 1/8W 5%	1-118-223-25
R429	22K 1/8W 5%	1-118-223-25
R430	150 1/8W 5%	1-118-151-25
R431	150 1/8W 5%	1-118-151-25
R432	1K 1/8W 5%	1-118-102-25
R433	1K 1/8W 5%	1-118-102-25
R434	100K 1/8W 5%	1-118-104-25
R439	2.7K 1/8W 5%	1-118-272-25
R440	22K 1/8W 5%	1-118-223-25
R443	5.6K 1/8W 5%	1-118-562-25
R444	5.6K 1/8W 5%	1-118-562-25
R445	620 1/8W 5%	1-118-621-25
R446	470K 1/8W 5%	1-118-474-25
R447	22K 1/8W 5%	1-118-223-25
R450	20K 1/8W 5%	1-118-203-25
R451	20K 1/8W 5%	1-118-203-25
R452	20K 1/8W 5%	1-118-203-25
R453	10K 1/8W 5%	1-118-103-25
R454	10K 1/8W 5%	1-118-103-25
R455	10K 1/8W 5%	1-118-103-25
R457	220K 1/8W 5%	1-118-224-25
R501	1.2K 1/8W 5%	1-118-122-25
R502	2.2K 1/8W 5%	1-118-222-25
R701	1K 1/8W 5%	1-118-102-25
R702	1K 1/8W 5%	1-118-102-25
R703	680 1W 5%	1-141-681-23

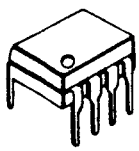
REF NO.	DISCRIPTION	CODE NO.
	RESISTORS	
R704	1K 1/8W 5%	1-118-102-25
R705	1K 1/8W 5%	1-118-102-25
R706	1K 1/8W 5%	1-118-102-25
R707	47K 1/8W 5%	1-118-753-25
	CAPACITOR'S	
C101	ELEC CEA 47 20% 16V	1-413-470-65
C102	MYLA CQMA 102J 5% 50V	1-506-102-45
C103	ELEC CEA 47 20% 16V	1-413-470-65
C104	CERA CCDSL 12J 5% 50V	1-886-120-45
C105	MYLA CQMA 222J 5% 50V	1-506-222-45
C106	MYLA CQMA 103J 5% 50V	1-506-103-45
C107	MYLA CQMA 333J 5% 50V	1-506-333-45
C108	ELEC CEA 0.47 20% 50V	1-416-478-65
C109	MYLA CQMA 103J 5% 50V	1-506-113-45
C110	MYLA CQMA 333J 5% 50V	1-506-333-45
C111	ELEC CEA 47 20% 16V	1-413-470-65
C201	MYLA CQMA 472J 5% 50V	1-506-472-45
C202	MYLA CQMA 222J 5% 50V	1-506-222-45
C203	ELEC CEA 47 20% 16V	1-413-470-65
C204	MYLA CQMA 104J 5% 50V	1-506-104-45
C205	MYLA CQMA 473J 5% 50V	1-506-473-45
C206	MYLA CQMA 104J 5% 50V	1-506-104-45
C207	MYLA CQMA 102J 5% 50V	1-506-102-45
C208	ELEC CEA 47 20% 16V	1-413-470-65
C209	MYLA CQMA 102J 5% 50V	1-506-102-45
C210	ELEC CEA 1 20% 50V	1-416-010-65
C211	MYLA CQMA 102J 5% 50V	1-506-102-45
C212	ELEC CEA 47 20% 16V	1-413-470-65
C213	MYLA CQMA 473J 5% 50V	1-506-473-45
C214	ELEC CEA 4.7 20% 50V	1-416-479-65
C215	ELEC CEA 1 20% 50V	1-416-010-65
C216	ELEC CEA 47 20% 16V	1-413-470-65
C218	MYLA CQMA 333J 5% 50V	1-506-333-45
C219	ELEC CEA 0.47 20% 50V	1-416-478-65
C220	ELEC CEA 47 20% 50V	1-413-470-65
C299	ELEC CEA 3.3 20% 50V	1-416-339-65
C301	CERA CCDSL 22J 5% 50V	1-886-220-45
C302	CERA CCDSL 22J 5% 50V	1-886-220-45
C303	ELEC CEA 1 20% 50V	1-416-010-65
C304	ELEC CEA 47 20% 16V	1-413-470-65
C305	CERA CCDSL 33J 5% 50V	1-886-330-45
C306	CERA CCDSL 33J 5% 50V	1-886-330-45
C308	ELEC CEA 47 20% 16V	1-413-470-65
C309	ELEC CEA 47 20% 16V	1-413-470-65
C401	STYROL CQSA 121J 5% 50V	1-536-121-41
C402	STYROL CQSA 121J 5% 50V	1-536-121-41
C403	CERA CCDSL 22J 5% 50V	1-886-220-45
C404	CERA CCDSL 22J 5% 50V	1-886-220-45
C412	ELEC CEA 4.7 20% 50V	1-416-479-65
C413	ELEC CEA 4.7 20% 50V	1-416-479-65
C415	ELEC CEA 4.7 20% 50V	1-416-479-65
C416	ELEC CEA 1 20% 50V	1-416-010-65

REF NO.	DISCRIPTION	CODE NO.
	CAPACITORS	
C501	ELEC CEA 2200 20% 16V	1-423-222-67
C502	ELEC CEA 2200 20% 16V	1-423-222-67
C503	ELEC CEA 4.7 20% 50V	1-416-479-65
C504	ELEC CEA 100 20% 50V	1-416-101-65
C505	ELEC CEA 100 20% 50V	1-416-101-65
C506	ELEC CEA 100 20% 50V	1-416-101-65
C507	ELEC CEA 100 20% 50V	1-416-101-65
C508	ELEC CEA 47 20% 16V	1-413-470-65
C509	ELEC CEA 47 20% 16V	1-413-470-65
C995	ELEC CEA 100 20% 16V	1-413-101-65
C996	ELEC CEA 33 20% 16V	1-413-330-65
C997	ELEC CEA 33 20% 16V	1-413-330-65
C998	ELEC CEA 33 20% 16V	1-413-330-65
C999	ELEC CEA 33 20% 16V	1-413-330-65
	CONNECTORS, WAFERS	
CN101	2M/M 8P	2-168-107-01
CN102	2M/M 4P	2-168-103-01
CN201	2M/M 4P	2-168-103-01
CN202	2M/M 4P	2-168-103-01
CN203	2.5MM 5P	2-168-124-01
CN301	2M/M 8P	2-168-310-01
CN302	2M/M 12P	2-168-318-01
CN303	2M/M 15P	2-168-319-01
CN201	2.5M/M 2P	2-168-121-01
CN401	2.5M/M 3P	2-168-122-01
CN3	2.5M/M 2P	2-168-121-01

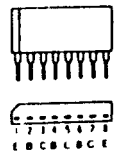
DISCRIPTION	CODE NO.
MISCELLANEOUS	
HEAT SINK 30M/M	3-710-701-02
TACK 2P PIN	2-155-502-01
FUSE HOLDER	2-999-114-01
FUSE T80MA/250V	2-998-217-01
TERMINAL WRAPPING	2-155-377-01
FRONT A PC BOARD	
VFD601, FLT 11MT-52GK	2-143-238-01
S/W TACT 177-620-002-00	2-208-999-01
OP301 8P 2.0MM	2-159-750-01
CP302 12P 2.0MM	2-159-749-01
CP303 15P 2.0MM	2-159-751-01
VFD HOLDER	3-812-504-02
FRONT B PC BOARD	
CP3 2P 2.5M/M	2-159-752-01
J701 JACK MINI	2-155-517-01
C701 CERA 0.01μF/250V	1-998-101-01
HP LGR 4502-5000	2-155-599-01
CN801 3P SHIELD 450M/M	2-159-743-01
POWER AC 230V 50HZ	
TRANS 600MM DC±10V V-DE	2-131-411-01
CORD AC NDG-009-0	2-211-109-02
MECHA ASS'Y CD MCD 350L	2-219-111-11
CONNECTOR ASS'Y 3P 500M/M	2-159-797-01
FILTER CORE OP 9.5-9.5-4.75H	2-138-608-01

IC LEAD IDENTIFICATION

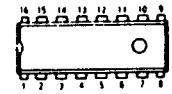
• MC4558C



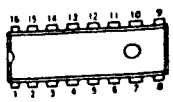
• STA341M



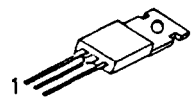
• BA618



• BA12004

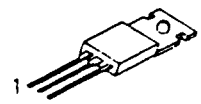


• MC7805



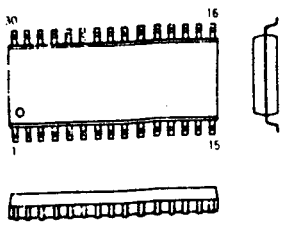
1. input 2 : GND 3 : Output

• MC7905

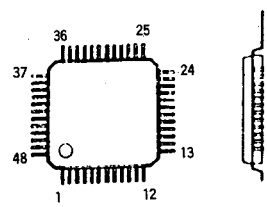


1 : GND 2 : Input 3 : Output

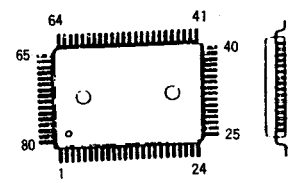
• CXA 1081M



• CXA1082A



• CXD1135Q



• PIN FUNCTIONS (CXA1081M)

PIN NO.	PIN NAME	I/O	FUNCTION AND OPERATION
1	RF1	Input	Input of capacitance coupled RF summing amplifier output
2	RFO	Output	RF summing amplifer output pin
3	RF−	Input	RF summing amplifer feedback input pin
4	P/N	Input	Laser diode P-sub N-sub selector pin
5	LD	Output	APC LD amplifier output pin
6	PD	Input	APC PD amplifier input pin
7	PD1	Input	RF 1-V amplifier(1) inverter input pin-connected to photodiode A+C pin for current input
8	PD2	Input	RF 1-V amplifier(2) inverter input pin-connected to photodiode B+D pin for current input
9	VC		Connected to VR
10	F	Input	1-V amplifier inverter input pin-connected to photodiode for current input
11	E	Input	1-V amplifier inverter input pin-connected to photodiode for current input
12	EO	Output	E1-V amplifier output pin
13	E1	Input	E1-V amplifier feedback input pin for E1-V amplifier gain adjustment
14	VR	Output	(Vcc-Vee)/2 DC voltage output pin
15	CC2	Input	Input of capacitance coupled DEFECT bottom hold output
16	CC1	Output	DEFECT bottom hold output pin
17	VEE		Ground connection
18	FE BIAS	Input	Focus error amplifier non−inverting bias pin Used in focus error amplifier CMR adjustment
19	FE	Output	Focus error amplifier output pin
20	TE	Output	Tracking error amplifier output pin
21	DEFECT	Output	DEFECT comparator output pin
22	MIRR	Output	MIRR comparator output pin
23	CP	Input	MIRR hold capacitor connector pin MIRR comparator non-inverting input pin
24	CB	Input	DEFECT bottom hold capacitor connector pin
25	DGND		Ground connection
26	ASY	Input	Auto asymmetry control input pin
27	EFM	Output	EFM comparator output pin
28	FOK	Output	Focus OK comparator output pin
29	$\overline{\text{LDON}}$	Input	Laser diode ON OFF switching
30	VCC		Positive power supply pin

• PIN FUNCTIONS (CXA1082AQ)

PIN NO.	PIN NAME	I/O	FUNCTION AND OPERATION
1	VC		Serial reference voltage input pin
2	FGD		Connect to pin 3 to switch focus serve OFF when defect occurs
3	FS3		Internal DFCT switch closed when pin high
4	FLB		Focus servo low region boost external time constant pin
5	FEO	Output	Focus drive output connect to low − end equalizer
6	FE−	Input	Focus amplifier inverter input pin
7	SRCh		Focus search waveform generation external time constant connector pin
8	TGU	Output	Tracking low−end equalizer connection output pin
9	TG2		Pin discharge switch for starting focus search from lens center
10	AVCC		+5V connection
11	TAO	Output	Tracking drive output
12	TA−	Input	Tracking amplifier inverter input pin
13	SL−	Input	Sled amplifier non−inverting input pin
14	SLO	Output	Sled drive output
15	SL−	Input	Sled amplifier inverter input pin

PIN NO.	PIN NAME	I/O	FUNCTION AND OPERATION
16	HOME	Input	Sled home position detector switch input pin
17	FSET		Focus tracking phase compensation peak and CLV low-pass filter of setting pin
18	SENS	Output	Output of FZC. AS. TZC. SSTOP and $\overline{BUSY}$ depending on command from CPU
19	AVEE		AGND connection
20	COUT	Output	Track counter signal output
21	DIRC		Not used
22	XRST	Input	Reset input pin reset when "L"
23	DATA	Input	Serial data input from CPU
24	XLT	Input	Latch input from CPU
25	CLX	Input	Serial data transfer clock input from CPU
26	DGND		DGND connection
27	BW1		Loop filter external time constant pin
28	PD1	Input	Input of CXD1135 phase comparator output PDO
29	ISET		Current which determines focus search, track jump, and sled kick height
30	VCOF		VCC free-running frequency nore or less inversely
31	3.5V	Output	Proportional to resistance value between pins 30 and 31
32	C864	Output	864MHz VCO output pin
33	LOCK		Not used
34	MDP		Connect to MDP pin of CXD1135
35	MON		Connect to MON pin of CXD1135
36	FSW		CLV servo error signal low – pass filter external time constant pin
37	DVCC		+5V connection
38	SPDL–	Input	Spindle drive amplifier inverter input pin
39	SPDLO	Output	Spindle drive output
40	WDCK	Input	Auto–sequence clock input 176.4kHz
41	FOK	Input	FOK signal input pin
42	MIRR	Input	Mirror signal input pin
43	DVEE		DGND connection
44	DFCT	Input	DEFECT signal input pin–defect countermeasure circuit activated when this input is high
45	TE	Input	Tracking error signal input pin
46	TZC	Input	Tracking zero–cross comparator input pin
47	ATSC	Input	Tracking lens offset detector window comparator input pin
48	FE	Input	Focus error signal input pin

• PIN FUNCTIONS (DXD1135Q)

PIN NO.	PIN NAME	I/O	FUNCTION AND OPERATION
1	FSW	Output	Spindle motor output filter time constant selector output
2	MON	Output	Spindle motor ON/OFF control output
3	MDP	Output	Spindle motor drive output– "rough" control in CLV•S mode and phase control in CLV•P mode
4	MDS	Output	Spindle motor drive output–speed control in CLV•P mode
5	EFM	Input	EFM signal input from RF amplifier
6	ASY	Output	EFM signal slice level control output

PIN NO.	PIN NAME	I/O	FUNCTION AND OPERATION
7	LOCK	Output	Sampling of GFS signal by WFCK/16–"H" output if "H", "L" output if "L" detected eight times in succession
8	VCOO	Output	VCO output-f=8.6436MHz when EFM signal is locked
9	VCOI	Input	VCO input
10	TEST	Input	(OV)
11	PDO	Output	EFM signal and VCO/2 phase comparison output
12	Vss	–	Ground (OV)
13	CLK	Input	Serial data transfer clock input from CPU–data latched by clock leading edge
14	XLT	Input	Latch input from CPU–8–bit shift register data (serial data from CPU) is latched in each register.
15	DATA	Input	Serial data input from CPU
16	XRST	Input	System reset signal input–reset when "L"
17	CNIN	Input	Tracking pulse input
18	SENS	Output	Output of internal status according to address
19	MUTG	Input	Muting input – when ATTM of internal register A is "L" MUTG "L" denotes normal status, and "H" muted status
20	CRCF	Output	Sub–code Q CRC check result output
21	EXCK	Input	Clock input for sub–code serial output
22	SBSO	Output	Sub–code serial output
23	SUBQ	Output	Sub–code Q output
24	SCOR	Output	Sub–code synchronizing S0+S1 output
25	SOCK	Input/Output	Sub–code Q read clock
26	SQCK	Input	SQCK selector input
27	DOTX	Output	Digital out output ($\overline{WFCK}$ output)
28	GFS	Output	Frame synchronizing lock status indicator output
29	DBO8	Input/Output	External RAM data pin–DATA8 (MSB)
30	DBO7	Input/Output	External RAM data pin–DATA7
31	DBO6	Input/Output	External RAM data pin–DATA6
32	DB06	Input/Output	External RAM data pin–DATA5
33	V_{DD}	–	Power supply (+5V)
34	DBO4	Input/Output	External RAM data pin–DATA4
35	DBO3	Input/Output	External RAM data pin–DATA3
36	DEO2	Input/Output	External RAM data pin-DATA2
37	DB01	Input/Output	External RAM data pin–DATA1(LSB)
38	RAO1	Output	External RAM address output–ADDRO1(LSB)
39	RAO2	Output	External RAM address output–ADDRO2
40	RAO3	Output	External RAM address output–ADDRO3
41	RAO4	Output	External RAM address output–ADDRO4
42	RAO5	Output	External RAM address output–ADDRO5
43	RAO6	Output	External RAM address output–ADDRO6
44	RAO7	Output	External RAM address output–ADDRO7
45	RAO8	Output	External RAM address output–ADDR08
46	RAO9	Output	External RAM address output–ADDRO9
47	RA10	Output	External RAM address output–ADDRO10
48	RA11	Output	External RAM address output–ADDRO11(MSB)

PIN NO.	PIN NAME	I/O	FUNCTION AND OPERATION
49	RAWE	Output	External RAM write enable signal output(active "L")
50	RACS	Output	External RAM chip select signal output(active "L")
51	C4M	Output	X'tal frequency division output (f=4.2336MHz)
52	Vss	—	Ground(OV)
53	XTA1	Input	Crystal oscillator input(f=8.4672MHz)
54	XTA0	Output	Crystal oscillator output(f=8.4672MHz)
55	MD1	Input	Mode selector input 1
56	MD2	Input	Mode selector input 2
57	MD3	Input	Mode selector input 3
58	SLOB	Input	Audio data output code selector input—2's complement output if "L" offset binary output if "H"
59	PSSL	Input	Audio data output mode selector input--serial output if "L" parallel output if "H"
60	APTR	Output	Aperture correction control output—"H" when right channel
61	APTL	Output	Aperture correction control output—"L" when left channel
62	DAO1	Output	C1F1 output
63	DAO2	Output	C1F2 output
64	DAO3	Output	C2F1 output
65	DAO4	Output	C2F2 output
66	DAO5	Output	C2FL output
67	DAO6	Output	C2PO output
68	DAO7	Output	RFCK output
69	DAO8	Output	WFCK output
70	DAO9	Output	$\overline{\text{PLCK}}$ output
71	DA10	Output	UGFS output
72	DA11	Output	GTOP output
73	V_{DD}	—	Power supply (+5V)
74	DA12	Output	RAOV output
75	DA13	Output	C4LR output
76	DA14	Output	$\overline{\text{C210}}$ output
77	DA15	Output	C210 output
78	DA16	Output	DATA output
79	WDCK	Output	Strobe signal output (176.4kHz)
80	LRCK	Output	Strobe signal output (88.2kHz)

NOTE:

C1F1 :, C1F2 : C1 decoding error correction status monitor output

C2F1 :, C2F2 : C2 decoding error correction status monitor output

C2FL : Corrected status output — "H" if C2 system currently being corrected cannot be corrected

C2PO : C2 pointer indication output—synchronized with audio data output

RFCK : Read frame clock output—crystal oscillator 7.35kHz

WFCK : Write frame clock output—f = 7.35kHz when crystal oscillator is locked

$\overline{\text{PLCK}}$: VCO/2 output— f=4.3218MHz when FEM signal is locked

UGFS : Unprotected frame synchronizing pattern output

GTOP : Frame synchronization protection status indicator output

RAOV: ±4 frame litter absorption RAM overflow and underflow indicator output

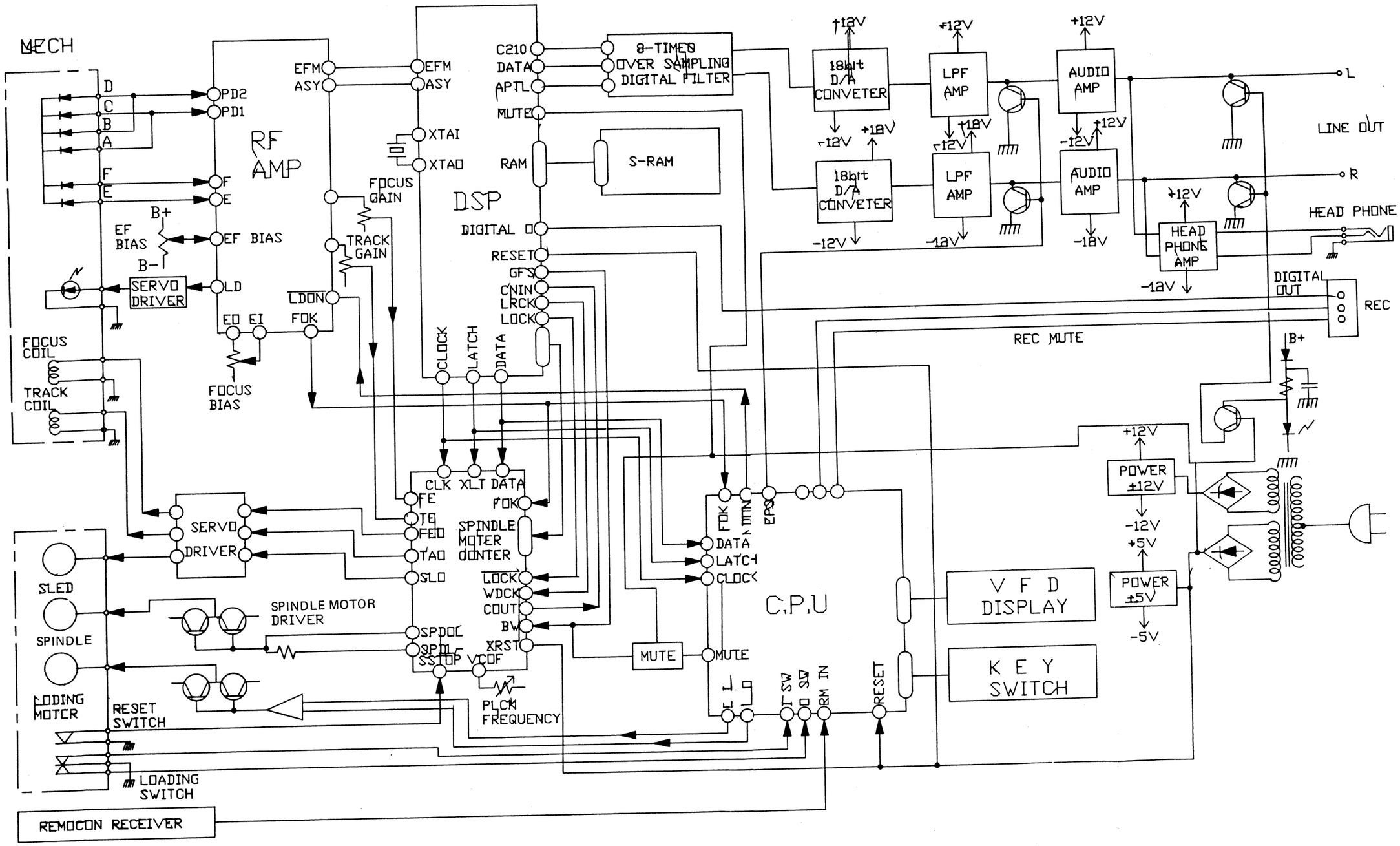
C4LR : Strobe signal 176.4KHz

$\overline{\text{C210}}$: C210 inverting output

C210 : Bit clock output—2.1168MHz

DATA: Audio signal serial data output

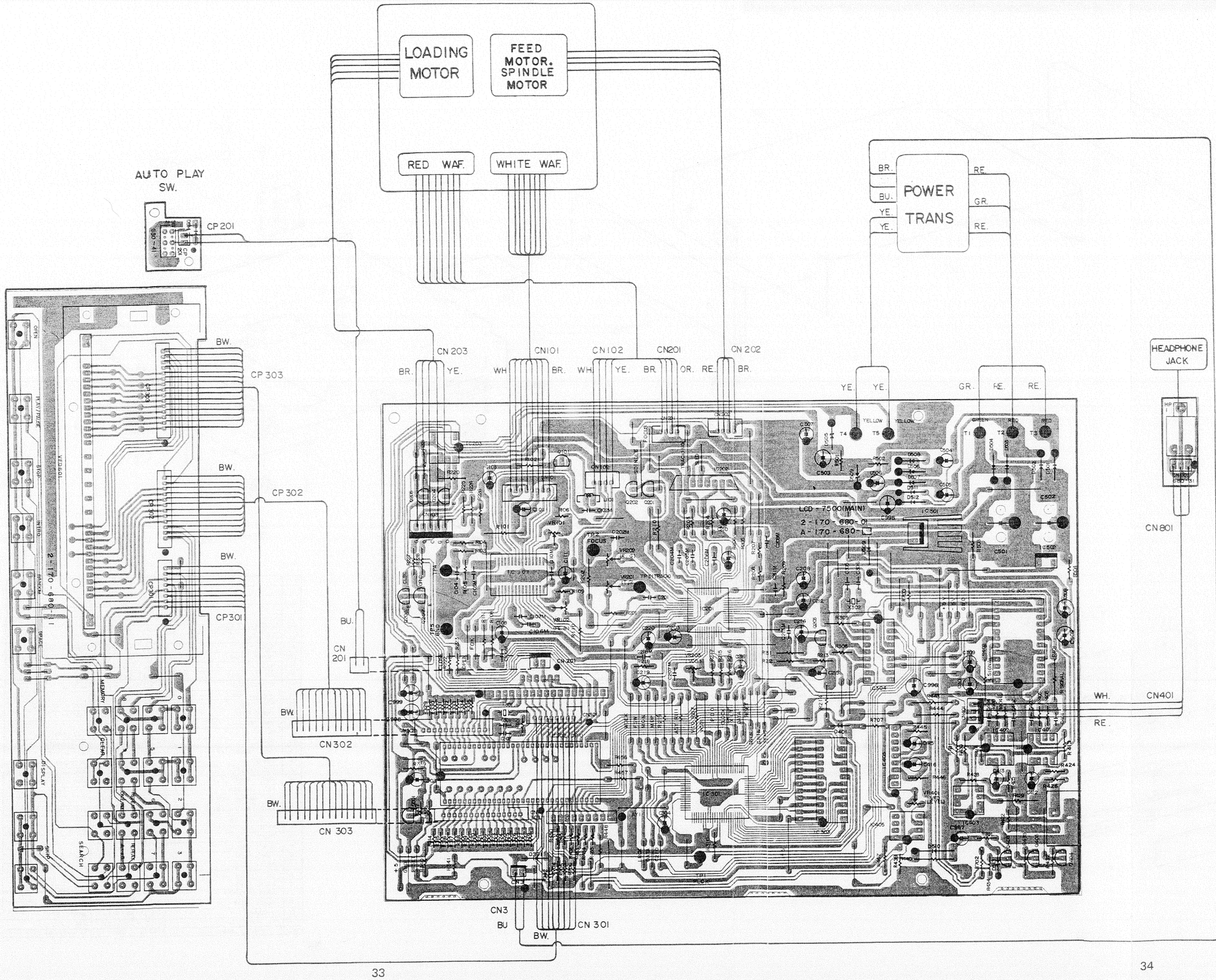
BLOCK DIAGRAM



SCHEMATIC DIAGRAM

PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
IC301	0	0	0	0	2.2	2	0	2.4	2.2	0	3.4	0	5	5	0	5	0	0	5	0	0	+	0	0	5	5	2.6	0	2.2	2.4	2.4	2	5	2	1.1	2.6	2.5	2.4	2.8	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	4.3	2.2	2.2	0	2.4	2.1	0	5	5	0	0	1.2	1.3	3.7	3.7	1.9	1.9	5	2.5	2.5	2	5	5	5	2.4	2.2	2.3	0	2.4	2.5
IC302	-19	-19	-19	-19	-19	-12	-12	-12	-9	-12	-12	-12	-12	16	21	21	21	21	0	5	-22	0.5	0	0	3	.2	4.8	5	5	0	5	5	5	5	0	.1	.1	0	5	4.8	4.8	5	5	5	5	5	5	5	4.6	0	5	2.2	2.3	0	4.6	5	5	5	0	19	19	19	19	19	19																		
IC201	0	0	0	0	.4	0	.7	0	0	5	.6	0	0	.6	0	0	-11	.1	-5	.1	5	5	0	5	4.5	0	3.3	3.3	2	2.2	3.3	5	2	0	0	0	0	5	0	-.5	2.8	.1	0	-5	-4.5	0	0	0	0																														
IC101	0	0	0	4.6	4.8	-5	0	0	1.0	0	0	0	0	0	0	0	-1.1	1.2	-5	0	0	0	-4.1	0	-0.5	0	0	2.5	2.2	0	0	5																		

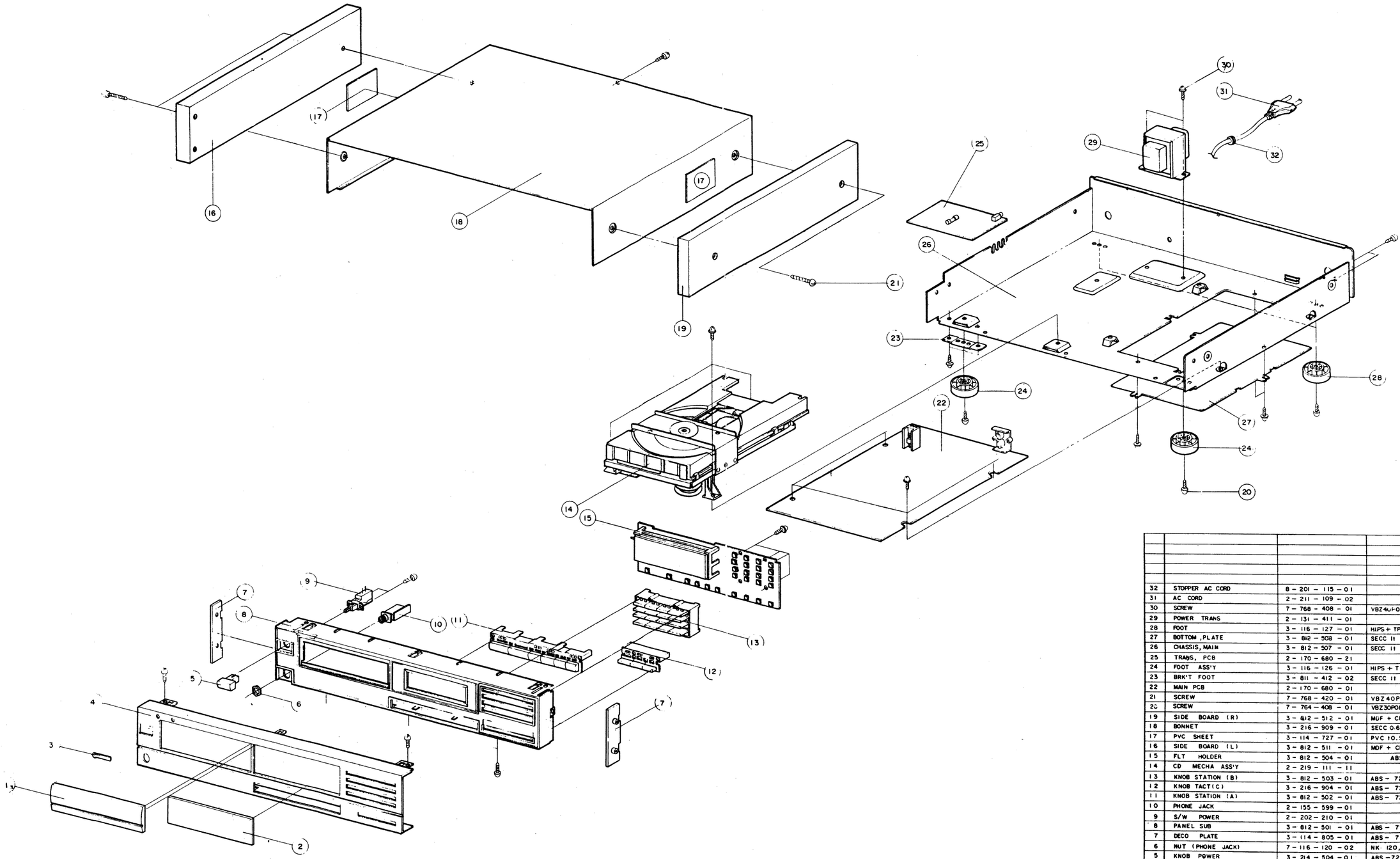
WIRING DIAGRAM



NOTE

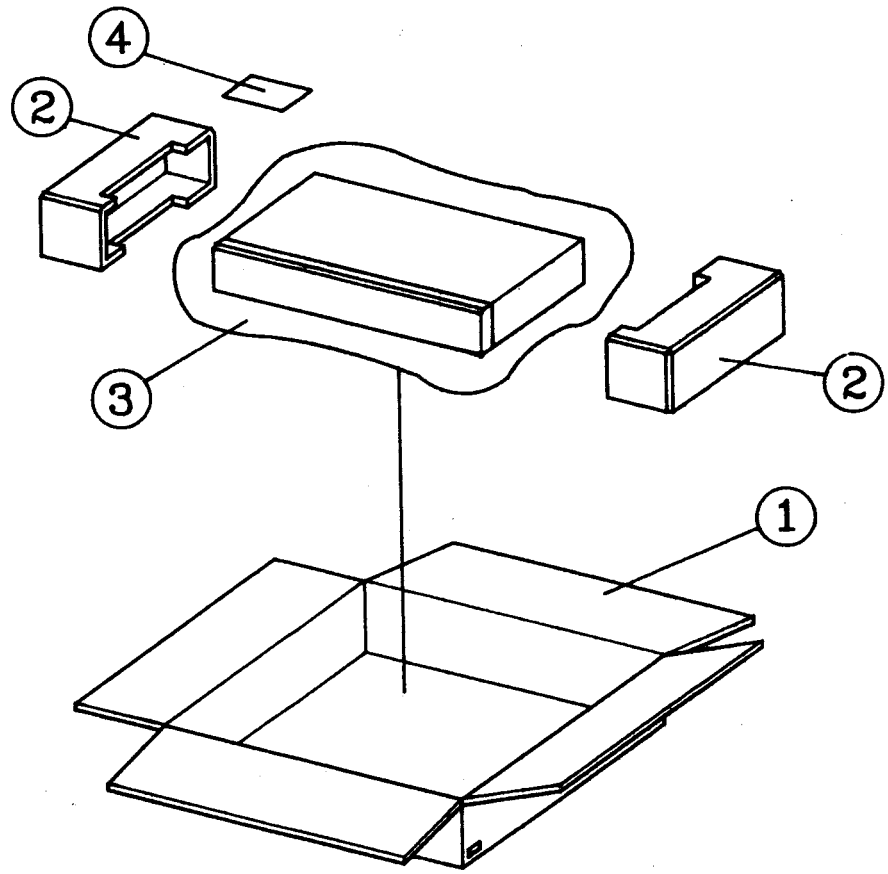
BR : BRACK
RE : RED
BU : BLUE
BW : BRAWN
YE : YELLOW
WH : WHITE
OR : ORANGE
GR : GREEN

EXPLODED VIEW



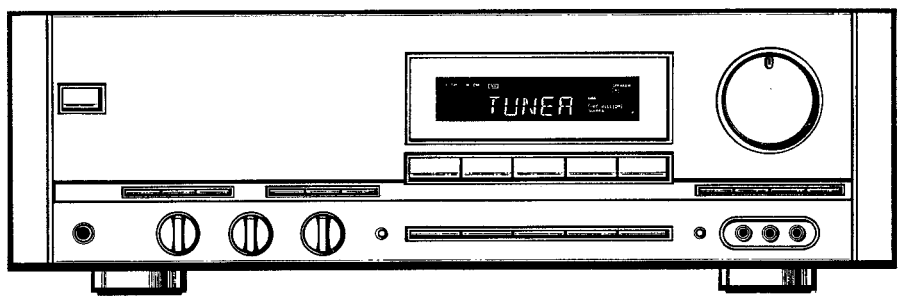
32	STOPPER AC CORD	8 - 201 - 115 - 01	
31	AC CORD	2 - 211 - 109 - 02	
30	SCREW	7 - 768 - 408 - 01	VBZ40F080FZK
29	POWER TRANS	2 - 131 - 411 - 01	
28	FOOT	3 - 116 - 127 - 01	HIPS + TPR BLACK
27	BOTTOM ,PLATE	3 - 812 - 508 - 01	SECC 11
26	CHASSIS, MAIN	3 - 812 - 507 - 01	SECC 11
25	TRANS, PCB	2 - 170 - 680 - 21	
24	FOOT ASS'Y	3 - 116 - 126 - 01	HIPS + TPR GOLD
23	BRK'T FOOT	3 - 811 - 412 - 02	SECC 11
22	MAIN PCB	2 - 170 - 680 - 01	
21	SCREW	7 - 768 - 420 - 01	VBZ40P200FZK
20	SCREW	7 - 764 - 408 - 01	VBZ30P080FZK
19	SIDE BOARD (R)	3 - 812 - 512 - 01	MDF + CRYSTAL
18	BONNET	3 - 216 - 909 - 01	SECC 0.61 + PVC 0.21
17	PVC SHEET	3 - 114 - 727 - 01	PVC 10.5
16	SIDE BOARD (L)	3 - 812 - 511 - 01	MDF + CRYSTAL
15	FLT HOLDER	3 - 812 - 504 - 01	ABS
14	CD MECHA ASS'Y	2 - 219 - 111 - 11	
13	KNOB STATION (B)	3 - 812 - 503 - 01	ABS - 720
12	KNOB TACT(C)	3 - 216 - 904 - 01	ABS - 720
11	KNOB STATION (A)	3 - 812 - 502 - 01	ABS - 720
10	PHONE JACK	2 - 155 - 599 - 01	
9	S/W POWER	2 - 202 - 210 - 01	
8	PANEL SUB	3 - 812 - 501 - 01	ABS - 720
7	DECO PLATE	3 - 114 - 805 - 01	ABS - 710, GOLD
6	NUT (PHONE JACK)	7 - 116 - 120 - 02	NK 120, FMC
5	KNOB POWER	3 - 214 - 504 - 01	ABS - 720
4	PANEL, FRONT	3 - 812 - 506 - 01	AL CRYSTAL
3	BADGE ASS'Y	3 - 212 - 319 - 11	CU + ABS, GOLD
2	WINDOW	3 - 812 - 509 - 01	ACRYL 3T
1	CD DOOR	3 - 812 - 505 - 01	ABS - 720
NO.	PARTS NAME	PARTS NO.	MATERIAL

PACKING



NO	PARTS NUMBER	DESCRIPTION	Q'TY
1	3-812-510-01	PACKING CASE	1
2	3-116-506-02	SIDE PAD	2
3	3-415-046-01	POLY SHEET	1
4	3-812-513-01	OPERATING MANUAL	1
5			
6			

SERVICE MANUAL



SPECIFICATION

Audio Section

Continuous average power output is 100 watts (or 130 watts) per channel, min., at 8 ohms from 1 KHz with no more than 0.05% total harmonic distortion.

Input (Sensitivity/Impedance)
- Phono MM 2.5mV/47KΩ
- MC 0.25mV/100Ω
- Tuner, CD, Aux, Tape1/Dat Play, Tape2/Video1 Play, Tape3/Video2 Play, Adaptor In 150mV/47KΩ

Phono Overload Level
- (T.H.D. 0.1%, 1KHz) 100mV

Output (Level/Impedance)
- Tape1/Dat Rec, Tape2/Video1 Rec, Tape3/Video2 Rec, Adaptor Out 150mV/2.2KΩ
- Headphone 67mV/8Ω

Frequency Response
- Phono MM 20Hz – 20 KHz ..... ±1dB
- Tuner, CD, Aux, Tape1/Dat Play, Tape2/Video1 Play, Tape3/Video2 Play, Adaptor in 10Hz – 50KHz ..... ±3dB

Tone Control
- Bass 100Hz ..... ±10dB
- Treble 10KHz ..... ±10dB

Subsonic Filter 15Hz (6dB/oct) ..... –3dB

High Filter 8KHz (6dB/oct) ..... –3dB

Hum and Noise (IHF, short circuited, A network)
- Phono MM 72dB
- Tuner, CD, Aux, Tape1/Dat Play, Tape2/Video1 Play, Tape3/Video2 Play, Adaptor In 95dB

Speaker Load Impedance
- A or B 8–16Ω
- A and B 16Ω
- Surround 8–16Ω

Video Section

Input (Sensitivity/Impedance)
- Video1 In, Video2 In 1Vp-p

Output (Level/Impedance)
- Video1 Out, Video2 Out, Monitor1, 2 ..... 1Vp-p

Miscellaneous

- Power Requirements AC230V, 50Hz
- Power Consumption ..... 420W (or 540W)
- Dimensions ..... 458(W)x135(H)x300(D) mm
- Weight (without package) 12.4kg

Furnished Parts

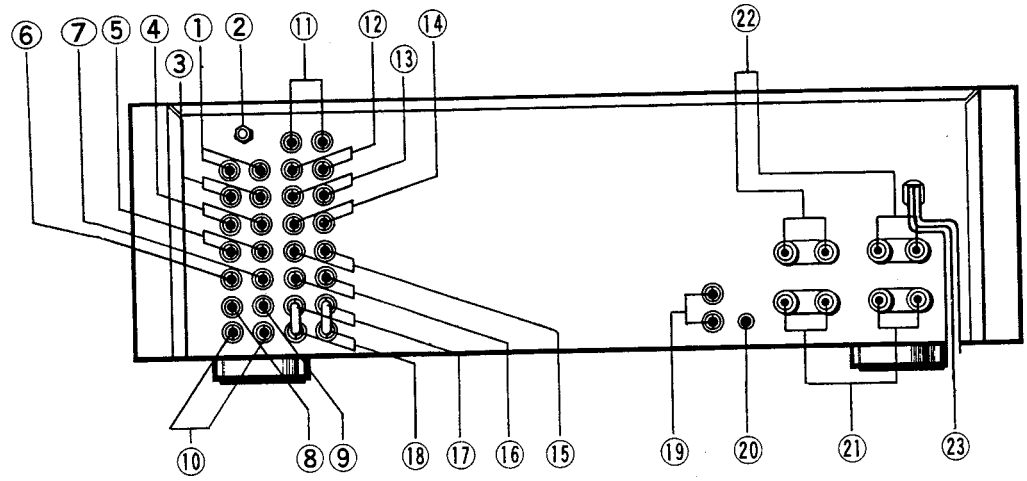
- Remote control cord 1
- Operating Instructions 1

NOTE:

Specifications and design subject to possible modification without notice due to improvements.

PANEL FEATURES

BACK PANEL



1. PHONO Input Terminals
2. Turntable Ground Terminal
3. AUX Input Terminals
4. TAPE3/VIDEO2 Audio Output Terminals
5. TAPE3/VIDEO2 Audio Input Terminals
6. VIDEO2 Video Output Terminal
7. VIDEO2 Video Input Terminal
8. VIDEO1 Video Output Terminal
9. VIDEO1 Video Input Terminal
10. MONITOR Terminals
11. TUNER Input Terminals
12. CD Input Terminals
13. TAPE1/DAT REC Terminals
14. TAPE1/DAT PLAY Terminals
15. TAPE2/VIDEO1 Audio Output Terminals
16. TAPE2/VIDEO1 Audio Input Terminals

NOTE:
Connect the white plug to the L (left) side, and the red plug to the R (right) side. Be sure to push the plugs in securely.

17. ADAPTOR Output Terminals
18. ADAPTOR Input Terminals

NOTE:
The ADAPTOR terminals are used when connecting an adaptor unit.
When not connecting an adaptor unit, be sure to install the connecting bars. If the connecting bars are removed, sound will no longer be emitted from the speakers.

19. SURROUND Output Terminals.

20. REMOTE INPUT Terminal
Connect to the REMOTE OUTPUT terminal of the TUNER (LT-7500)

NOTE:
When not connecting the remote and the audio terminals of the TUNER (LT-7500), will be not remote control.

21. SPEAKERS B terminals (left and right channels)

22. SPEAKERS A terminals (left and right channels)
Connect (+) to the speaker's (+) side, and (—) to the speaker's (—) side.

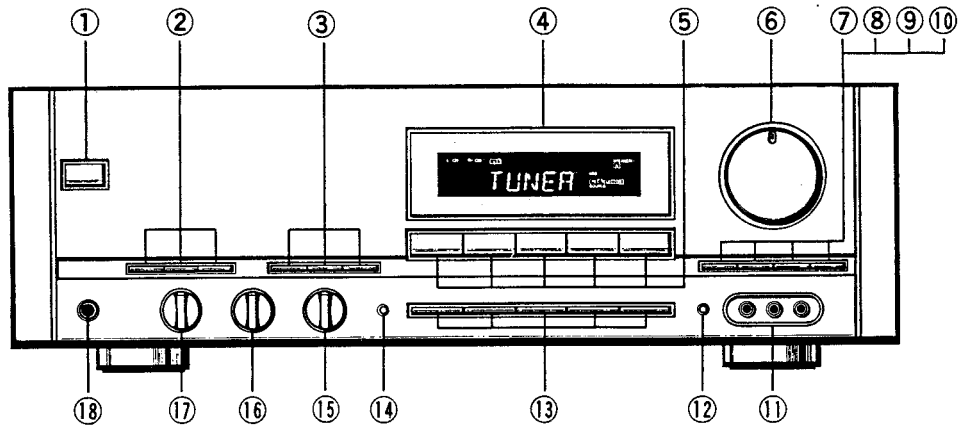
NOTE:
Do not allow the wire core to protrude and touch other terminals or wires.
If the cores of differing wires touch, damage may be caused to your components.

NOTE:
When speaker systems are connected to only one of the SPEAKER A, B terminals, such speakers should have rated impedance in the range of 8 – 16 ohms.

23. AC Power Cord
Connect this cord to the AC power outlet of the TUNER (LT-7500).

PANEL FEATURES

FRONT PANEL



1. Power Switch

Push this switch to turn on or turn off power.

2. Speakers Selector Switchs

Use this selector to select the speaker systems.

[A] – Use this switch to listen to the speaker systems connected to the SPEAKERS A terminals.

[B] – Use this switch to listen to the speaker systems connected to the SPEAKERS B terminals.

[SURROUND] – Use this switch to listen to the speaker systems connected to the SPEAKERS SURROUND terminals

3. Monitors Selector Switches

Use this selector to select the monitors.

[TAPE2/VIDEO1] – Use this switch to play the component connected to the TAPE2 /VIDEO1 TERMINALS.

[TAPE3/VIDEO2] – Use this switch to play the component connected to the TAPE3 /VIDEO2 TERMINALS.

[TAPE M. OFF] – Use this switch to not play a TAPE/VIDEO or MONITOR. (When you have set the function selector to PHONO MM, MC, TUNER, CD, AUX, TAPE1/ DAT for an alternative program source.)

4. Multi Operation Display Panel

5. Input Function Selector Switches

Use this selector to select the audio component for playback.

[PHONO] – Press when playing records on a turntable.

[TUNER] – Press when listening to a radio broadcast.

[CD] – Press when playing compact disc on a CD Player.

[AUX] – Press when playing to programs from a component connected to the AUX terminals.

[TAPE1/DAT] – Press when playing to component connected to the TAPE1/DAT terminals.

6. Volume Control/Indicator

Use to adjust sound volume level.
Turn to the right side to increase volume.
Turn to the left side to decrease volume.

7. MM/MC Selector Switch

Set in accordance with the type of cartridge used in your record player. Press to turn to the unit MM and MC.

[MM] : Depressed position – Set to this position when using an MM (moving magnet) cartridge or an MC (moving coil) cartridge with high output of 1 mV or more.

[MC] : Release position – Set to this position when using an MC (moving coil) cartridge.

NOTE:

This selector switch can also be used with only PHONO function.

8. High Filter Switch

Use this switch when effective in suppressing high-frequency noise or noise from scratches on records being played.

The high filter serves to attenuate frequencies higher than 8 KHz in a 6 dB/oct slope.

9. Subsonic Filter Switch

Use this switch when playing records with coarse grooves.

The subsonic filter serves to attenuate frequencies lower than 15 Hz in a 6 dB/oct slope.

10. Meter Range Switch

11. Video 2 Front Panel Input Terminals

Use to connect a second video cassette recorder.

NOTE:

When using this terminals, do not connected at VIDEO 2 rear panel input terminals.

12. Mute Switch

Use to temporarily reduce the sound volume to MIN. The volume is restored when pressed again.

13. Rec Selector Switches

Switch to select recording signal.

When set at other than SOURCE or OFF position, signals can be recorded during playback of the equipment selected by input selector switches.

[OFF]	— In this position nothing from the REC terminals of TAPE1/DAT, TAPE2/VIDEO1, TAPE3/VIDEO2 will be output. Select it when not recording, output terminal will be disconnected, improving sound quality.
[SOURCE]	— To record the equipment selected by INPUT SELECTOR switches.
[TUNER]	— To record from a TUNER.
[COPY 1>2]	— To copy the TAPE2/VIDEO1 playback onto TAPE3/VIDEO2.
[COPY 2>1]	— To copy the TAPE3/VIDEO2 playback onto TAPE2/VIDEO1.

14. Source Direct Switch

Use this switch when you do not with to pass the output from input terminal equipment through the TONE circuit.

15. Balance Control

Use to adjust the sound balance between the left and right speakers.

When turned to the L side, the sound of the right speaker decreases.

When turned to the R side, the sound of the left speaker decreases.

16. Treble Tone Control

Use to adjust the high-frequency tone at low volume level.

The center position is the fiat(normal) position. When turned to the right, high-frequency tones are emphasized; When turned to the left, high-frequency tones are de-emphasized.

17. Bass Tone Control

Use to adjust the low-frequency tone at low volume level.

The center position is the fiat(normal) position. When turned to the right, low-frequency tones are emphasized; When turned to the left, low-frequency tones are de-emphasized.

NOTE:

These functions (TREBLE, BASS) does not operate when the SOURCE DIRECT switch is ON position.

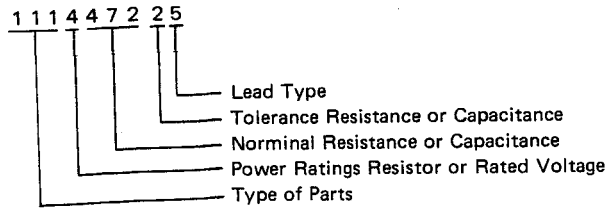
18. Phones Jacks

When using headphones, insert the plug into this jacks.

ELECTRICAL PARTS LIST

NOTE:

When ordering parts first convert parts number into code form as shown in the following examples.


1 1 1 4 4 7 2 2 5
Lead Type
Tolerance Resistance or Capacitance
Norminal Resistance or Capacitance
Power Ratings Resistor or Rated Voltage
Type of Parts

RESISTOR

ex) Power Ratings Resistors

8 ... 1/8W	4 ... 1/4W	5 ... 1/2W
1 ... 1W	2 ... 2W	7 ... 4W

ex) Resistor Value

479 ... 4.7Ω	560 ... 56Ω	681 ... 680Ω
822 ... 8.2KΩ	123 ... 12KΩ	224 ... 220KΩ

*CARBON film Resistor; 1 [1][1] 437225 (3.7KΩ, 1/4W)

CAPACITANCE

ex) Rated Voltage

0 ... 4V	1 ... 6.3V	2 ... 10V	3 ... 16V
4 ... 25V	5 ... 35V	6 ... 50V	7 ... 63V
8 ... 80V	9 ... 100V		

ex) Type of Ceramic Capacitor

71 ... CKDYB	75 ... CKDYF	80 ... CCDCH
88 ... CCDSL	84 ... CCDRH	86 ... CCDTH

ex) Capacitor Value

040 ... 4pF	470 ... 47pF	221 ... 220pF
182 ... 1800pF	103 ... 0.01 μF	473 ... 0.047 μF

ex) Tolerance Capacitance

0 ... C = ±0.25pF	1 ... D = ±0.5pF	2 ... F = ±1pF
3 ... G = ±2%	4 ... J = ±5%	5 ... K = ±10%
9 ... Z = +80% −20%	6 ... M = ±20%	

*ELECTROLYTIC	CAP:1 [4][2] 647365 (0.047 μF, 50V, ±20%)
*CERAMIC	CAP:1 [8][8] 647241 (4700pF, 50V, ±20%)
*MYLAR	CAP:1 [5][0] 647251 (4700pF, 50V, ±10%)
*STYROL	CAP:1 [5][3] 643141 (430pF, 50V, ±5%)

MAIN P.C. BOARD PARTS

REF. NO.	PARTS NO.	DESCRIPTION
• SEMICONDUCTORS		
IC802	244032463	BA10393
IC801	244033063	BA6138
IC401,403	244121071	MC7815
IC402	244121171	MC7915
IC404	244143571	MC7806
Q307,308	240215811	2SC2705P-0
Q309,310	240215711	2SC2603F
Q313,314	240014721	KTA968Y
Q301,302,303,304	240011425	KTA970BL
Q605	240210925	KTC1627A-Y
Q603,604	240211135	KTC1815GR
Q311,312	240216521	KTC2238Y
Q305,306,601,602	240211825	KTC2240BL
Q801	240610411	KRC1203
D401	241355991	KBPC25-02
D303,304,307,308	242603911	HZS4BLL
D406,601,602	242102735	1N4371A
D607	242115035	1N965B
D407	242122035	1N969B
D402,403,404,405, 610	241358165	1N4003L
D301,302,305,306 603-606,608,609 809-814	241017995	1SS133
• RELAY AND COIL		
RY101	214011701	VB24MBU
L301,302	212930501	0.7μH
• CAPACITORS		
C401,402	199111001	10000μF/80V
C601,602	144601065	1μF/50V, NP
C605	141901065	1μF/100V
C405	141910065	10μF/100V
C403,404	141610267	1000μF/50V
C415	199810101	0.01μF/250V
C311,312	188F02015	2P/500V
C313,314	188F06011	6P/500V
C319,320,321,322	188F10155	100P/500V

REF. NO.	PARTS NO.	DESCRIPTION
• RESISTORS		
AR801	134010701	22Kx7, ¼W
AR802,803	134099801	4.7Kx7, ¼W
R343,344	139020301	0.27x2, 5W+5W
R613,405	114210223	1K, 2W, 5%, LMF
R612	114168223	6.8K, 1W, 5%, LMF
R349, 350	114233123	330, 2W, 5%, LMF
R345-348, 402-404	114110023	10, 1W, 5%, LMF
R609	130410121	100, ¼W, 5%, PSF
R339,340	130422121	220, ¼W, 5%, PSF
R337,338,341,342	130447921	4.7, ¼W, 5%, PSF
R315,316	112410121	100, ¼W, 5%, PMF
R333,334,335,336	112422121	220,¼W, 5%, PMF
R401	112447921	4.7, ¼W, 5%, PMF
• OTHERS		
PHONE JACK	215559901	LGR4502-5000
HEAT SINK	371070202	40mm. Al
CONNECTOR, 7P	215858201	DO607#01

VOLUME P.C. BOARD PARTS

REF. NO.	PARTS NO.	DESCRIPTION
• SEMICONDUCTORS		
IC701	244215375	TA7291S
Q701	240211135	KTC1815GR
• COIL		
L702,703	212930401	10μH
L701	213050201	100μH
• OTHERS		
VR701	250133402	100KAx2, MOTOR

SPEAKER P.C. BOARD PARTS

REF. NO.	PARTS NO.	DESCRIPTION
• SEMICONDUCTORS		
Q607,609,611	240210925	KTC1627A-Y
Q606,608,610	240610411	KRC1203
D611,612,613	241017995	1SS133
• RESISTORS		
R616,619,622	114210223	1K, 2W, 5%, LMF
• RELAY AND OTHERS		
RY102,103,104	214011701	VB24MBU
SPEAKER TERMINAL	215575301	4P
PIN JACK	215560201	2P, P:14
MINI JACK	215551701	NKN-007-01

POWER SW P.C. BOARD PARTS

REF. NO.	PARTS NO.	DESCRIPTION
POWER SWITCH	220219501	ESB99713V
C900	199810101	0.01μF/250V

CONTROL 1 P.C. BOARD PARTS

REF. NO.	PARTS NO.	DESCRIPTION
• SEMICONDUCTORS		
IC104	244216575	TC9215P
IC201,202	244152041	NJM4558DD
Q501	240210925	KTC1627A-Y
Q101,102	240215415	KTC2878-A
Q103	240011835	KTA1015GR
IC803	260011701	TMP47C670N
X801	213835901	CST4.19MGW
D201,801-808,815	241017995	1SS133
• CAPACITORS		
C805	251682501	0.047F/5.5V
• RESISTORS		
VR202,203	250133101	100Kx2, 20C
VR201	250133201	250Kx2, MN
• RELAY AND OTHERS		
RY201	214011401	RZ24
F.L.T	214323901	8LT08GK
S801-822	220899901	KHH-10910
CONNECTOR, 9P	215858401	W-DO609#01

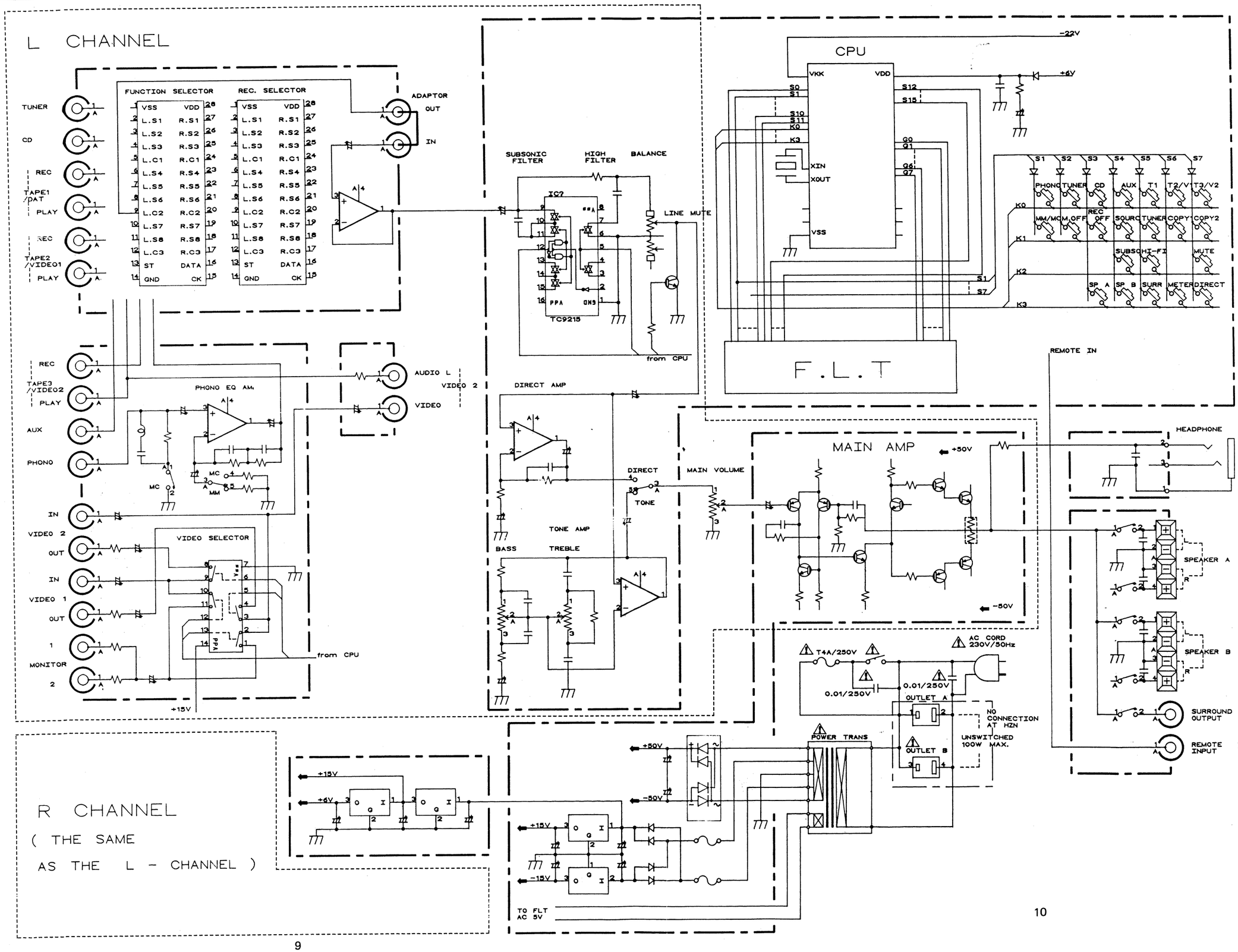
CONTROL 2 P.C. BOARD PARTS

REF. NO.	PARTS NO.	DESCRIPTION
• SEMICONDUCTORS		
IC101,102	244214975	TC9163N
IC103	244152041	NJM4558DD
• OTHERS		
PIN JACK	215556201	4P, P:14

CONTROL 3 P.C. BOARD PARTS

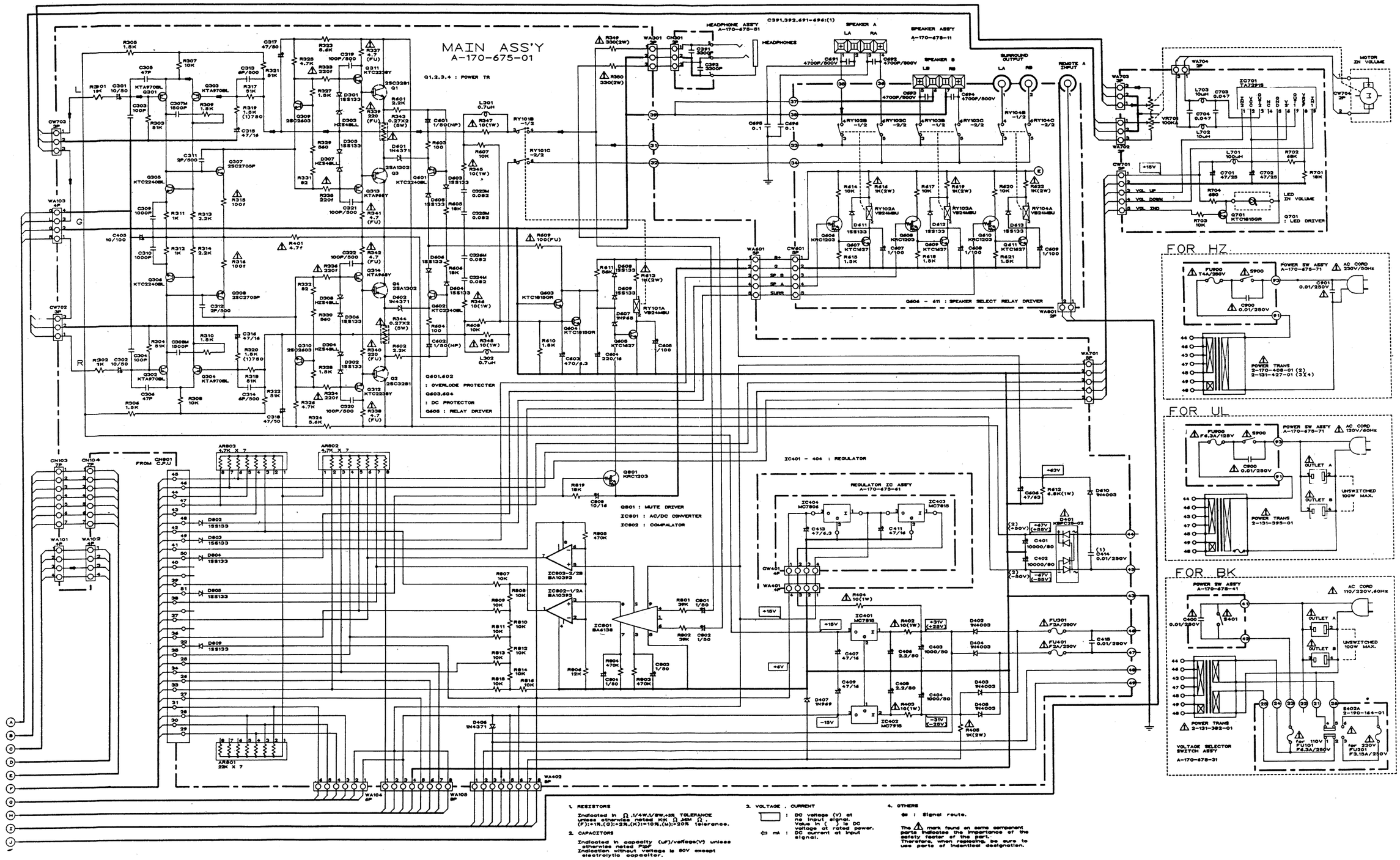
REF. NO.	PARTS NO.	DESCRIPTION
• SEMICONDUCTORS		
IC501	244140552	M5220P
IC901	244080731	GD4066B
Q501	240210925	KTC1627A-Y
Q907	240211135	KTC1815GR
Q908,909,911	240211825	KTC2240BL
D501,502	241017995	1SS133
• COIL AND RESISTORS		
L503,504	212925001	2.2μH
R933	114110223	1K, 1W, 5%, LMF
• CAPACITORS		
C903,904,906	141310267	1000μF/16V
• OTHERS		
PIN JACK 1P	215560501	1P, GOLD YELLOW
PIN JACK 1P	215560601	1P, GOLD WHITE
PIN JACK 1P	215560701	1P, GOLD RED
PIN JACK 2P	215560101	2P, GOLD, P:14
PIN JACK 2P	215560201	2P, P:14
PIN JACK 2P	215560301	2P, YELLOW, P:14
PIN JACK 4P	215560401	4P, YELLOW, P:14

BLOCK DIAGRAM



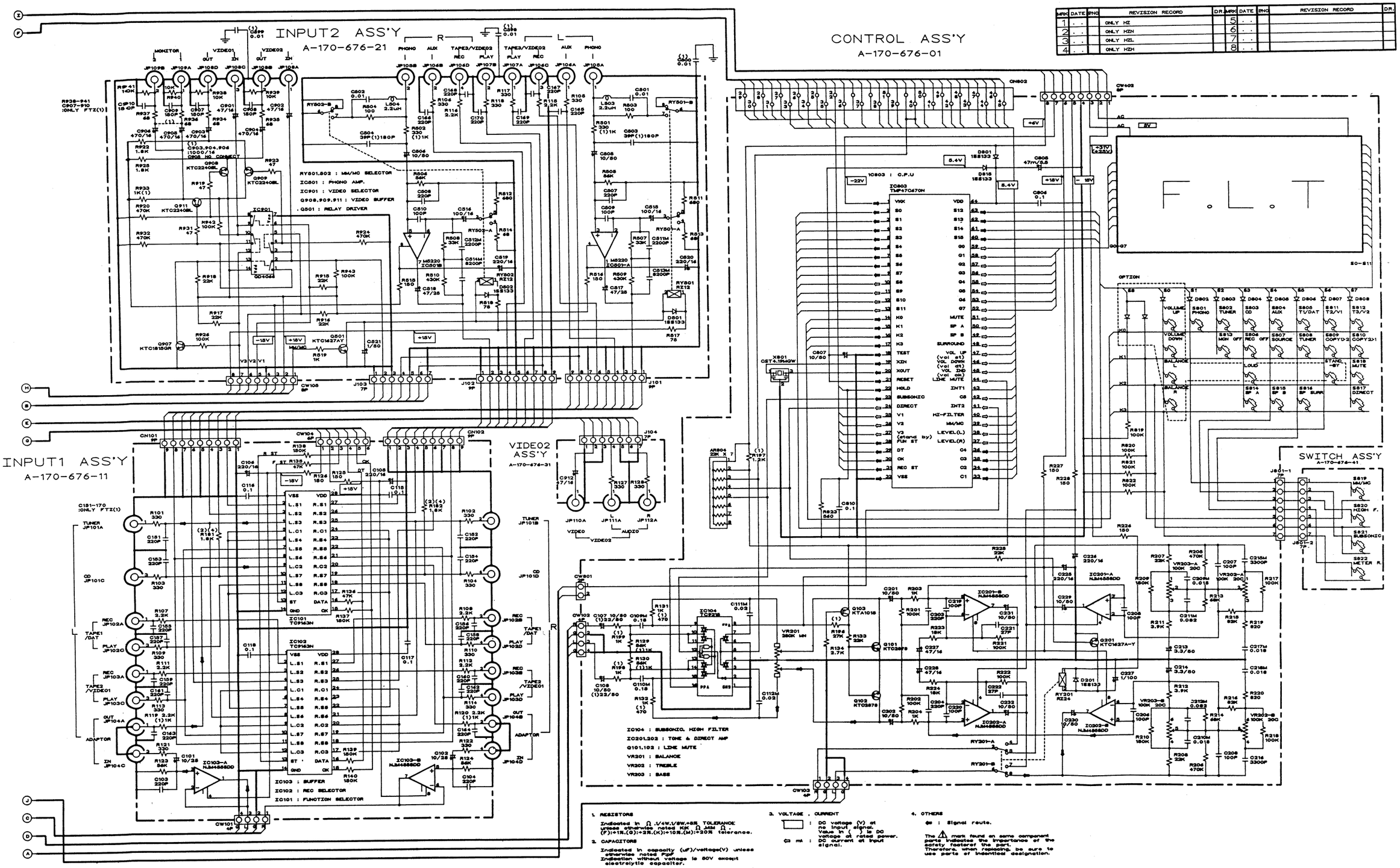
SCHEMATIC DIAGRAM

MRK	DATE	ENG	REVISION RECORD	DR.	MRK	DATE	ENG	REVISION RECORD	DR.
1	. .		ONLY HZ		5	. .			
2	. .		ONLY HZN		6	. .			
3	. .		ONLY HZL		7	. .			
4	. .		ONLY HZH		8	. .			

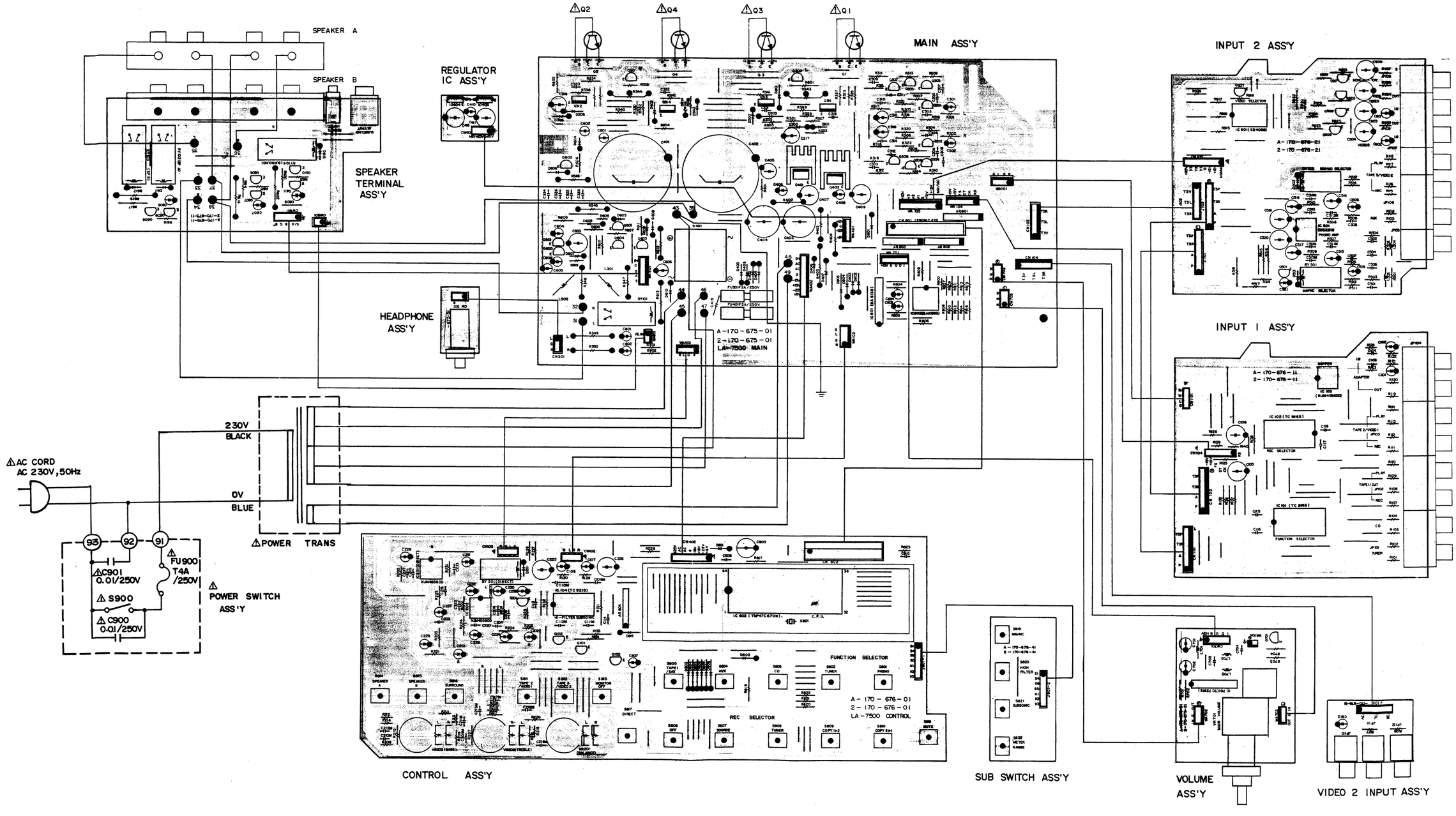

MAIN ASS'Y
A-170-675-01
Q1.2.3.4 : POWER TR
Q401.402 : OVERLODE PROTECTER
Q403.404 : DC PROTECTOR
Q605 : RELAY DRIVER
HEADPHONE ASSY A-170-675-81
HEADPHONES
SPEAKER A
SPEAKER ASSY A-170-675-11
SPEAKER B
SURROUND OUTPUT
REMOTE A INPUT
Q606 - 611 : SPEAKER SELECT RELAY DRIVER
IC401 - 404 : REGULATOR
REGULATOR IC ASSY A-170-675-61
Q801 : MUTE DRIVER
IC801 : AC/DC CONVERTER
IC802 : COMPALATOR
FOR HZ
FOR UL
FOR BK
POWER SW ASSY A-170-675-71
POWER SW ASSY A-170-675-41
POWER TRANS 2-131-427-01 (3X4)
POWER TRANS 2-131-395-01
POWER TRANS 2-131-382-01
VOLTAGE SELECTOR SWITCH ASSY A-170-675-31
AC CORD 230V/50Hz
AC CORD 120V/60Hz
AC CORD 110/220V,60Hz
UNSWITCHED 100W MAX.
OUTLET A
OUTLET B
1. RESISTORS
Indicated in Ω ,1/4W,1/8W,±5% TOLERANCE unless otherwise noted K(K Ω ,M(M Ω ; (F):±1%,(G):±2%,(K):±10%,(M):±20% tolerance.
2. CAPACITORS
Indicated in capacity (uF)/voltage(V) unless otherwise noted PuF
Indication without voltage is 50V except electrolytic capacitor.
3. VOLTAGE , CURRENT
DC voltage (V) at no input signal.
Value in ( ) is DC voltage at rated power.
DC current at input signal.
4. OTHERS
Signal route.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of indentical designation.

SCHEMATIC DIAGRAM

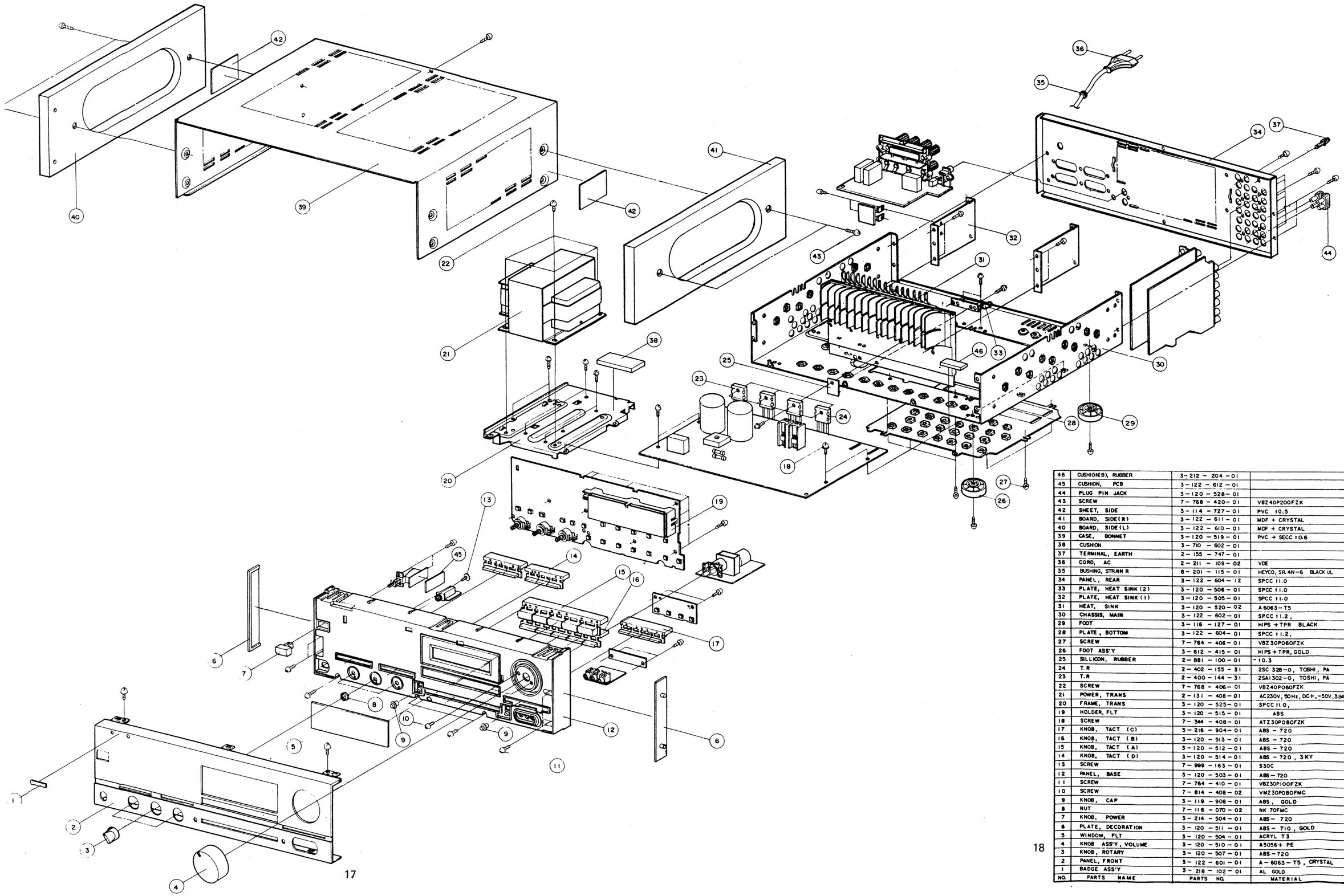
MRK	DATE	PNO	REVISION RECORD	DR.	MRK	DATE	PNO	REVISION RECORD	DR.
1	. .		ONLY HZ		5	. .			
2	. .		ONLY HZN		6	. .			
3	. .		ONLY HZL		7	. .			
4	. .		ONLY HZH		8	. .			


INPUT2 ASS'Y
A-170-676-21
CONTROL ASS'Y
A-170-676-01
INPUT1 ASS'Y
A-170-676-11
VIDEO2 ASS'Y
A-170-676-31
SWITCH ASS'Y
A-170-676-41
F.L.T
IC803 TMP47C470N : C.P.U
IC104 : SUBSONIC, HIGH FILTER
IC201,202 : TONE & DIRECT AMP
Q101,102 : LINE MUTE
VR201 : BALANCE
VR202 : TREBLE
VR203 : BASS
IC103 : BUFFER
IC102 : REC SELECTOR
IC101 : FUNCTION SELECTOR
RY501,502 : MM/MC SELECTOR
IC501 : PHONO AMP.
IC901 : VIDEO SELECTOR
Q908,909,911 : VIDEO BUFFER
Q501 : RELAY DRIVER
1. RESISTORS
Indicated in Ω ,1/4W,1/8W,+5% TOLERANCE
Unless otherwise noted K2K Ω M2M Ω
(F):±1%,(G):±2%,(K):±10%,(M):±20% tolerance.
2. CAPACITORS
Indicated in capacity (uF)/voltage(V) unless otherwise noted PpF.
Indication without voltage is 50V except electrolytic capacitor.
3. VOLTAGE , CURRENT
DC voltage (V) at no input signal.
Value in ( ) is DC voltage at rated power.
DC current at input signal.
4. OTHERS
Signal route.
The ⚠ mark found on some component parts indicates the importance of the safety factorer the part.
Therefore,when repairing, be sure to use parts of indentical designation.

WIRING DIAGRAM

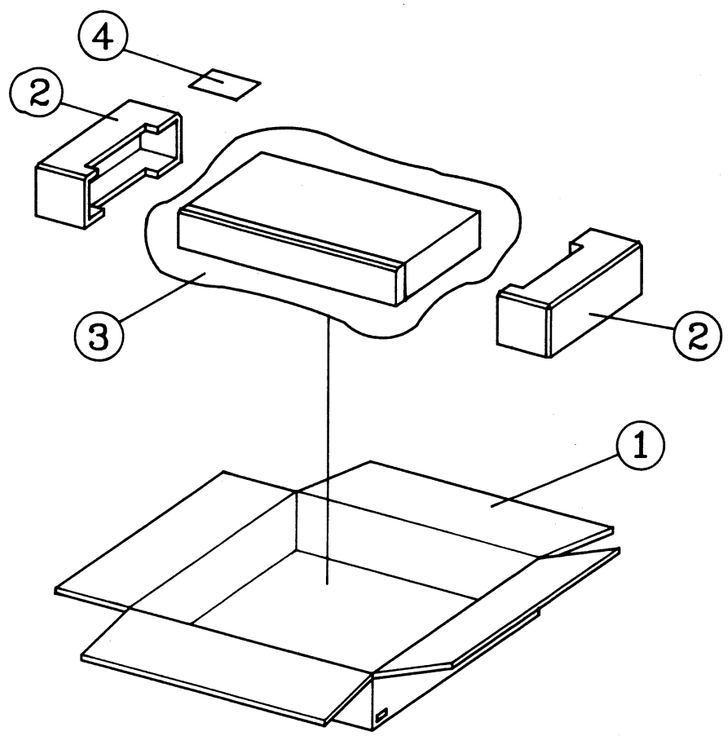


EXPLODED VIEW



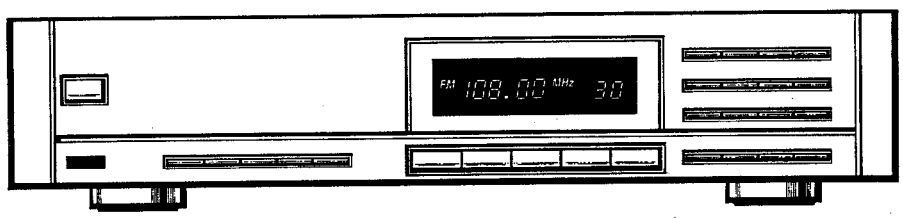
NO.	PARTS NAME	PARTS NO.	MATERIAL	Q'TY
46	CUSHION(B), RUBBER	3-212-204-01		1
45	CUSHION, PCB	3-122-612-01		1
44	PLUG PIN JACK	3-120-528-01		2
43	SCREW	7-768-420-01	VBZ40P200FZK	4
42	SHEET, SIDE	3-114-727-01	PVC 10.5	2
41	BOARD, SIDE(R)	3-122-611-01	MDF + CRYSTAL	1
40	BOARD, SIDE(L)	3-122-610-01	MDF + CRYSTAL	1
39	CASE, BONNET	3-120-519-01	PVC + SECC 10.6	1
38	CUSHION	3-710-602-01		1
37	TERMINAL, EARTH	2-155-747-01		1
36	CORD, AC	2-211-109-02	VDE	1
35	BUSHING, STRAIN R	8-201-115-01	HEYCO, SR4N-6 BLACK UL	1
34	PANEL, REAR	3-122-604-12	SPCC 11.0	1
33	PLATE, HEAT SINK(2)	3-120-506-01	SPCC 11.0	1
32	PLATE, HEAT SINK(1)	3-120-505-01	SPCC 11.0	2
31	HEAT, SINK	3-120-520-02	A6063-T5	1
30	CHASSIS, MAIN	3-122-602-01	SPCC 11.2,	1
29	FOOT	3-116-127-01	HIPS+TPR BLACK	2
28	PLATE, BOTTOM	3-122-604-01	SPCC 11.2,	1
27	SCREW	7-764-406-01	VBZ30P060FZK	26
26	FOOT ASS'Y	3-612-415-01	HIPS+TPR, GOLD	2
25	SILICON, RUBBER	2-881-100-01	t10.3	4
24	T.R	2-402-155-31	2SC 328-O, TOSHI, PA	2
23	T.R	2-400-144-31	2SA1302-O, TOSHI, PA	2
22	SCREW	7-768-406-01	VBZ40P060FZK	4
21	POWER, TRANS	2-131-408-01	AC230V, 50Hz, DC+,-50V, 3.9A, VDE	1
20	FRAME, TRANS	3-120-525-01	SPCC 11.0,	1
19	HOLDER, FLT	3-120-515-01	ABS	1
18	SCREW	7-344-408-01	ATZ30P080FZK	5
17	KNOB, TACT (C)	3-216-904-01	ABS-720	1
16	KNOB, TACT (B)	3-120-513-01	ABS-720	1
15	KNOB, TACT (A)	3-120-512-01	ABS-720	1
14	KNOB, TACT (D)	3-120-514-01	ABS-720, 3KY	2
13	SCREW	7-999-163-01	S30C	2
12	PANEL, BASE	3-120-503-01	ABS-720	1
11	SCREW	7-764-410-01	VBZ30P100FZK	47
10	SCREW	7-814-408-02	VMZ30P080FMC	2
9	KNOB, CAP	3-119-908-01	ABS, GOLD	2
8	NUT	7-116-070-02	NK 70FMC	3
7	KNOB, POWER	3-214-504-01	ABS-720	1
6	PLATE, DECORATION	3-120-511-01	ABS-710, GOLD	2
5	WINDOW, FLT	3-120-504-01	ACRYL T3	1
4	KNOB ASS'Y, VOLUME	3-120-510-01	A5056+PE	1
3	KNOB, ROTARY	3-120-507-01	ABS-720	3
2	PANEL, FRONT	3-122-601-01	A-6063-T5, CRYSTAL	1
1	BADGE ASS'Y	3-218-102-01	AL GOLD	1

PACKING



NO	PARTS NUMBER	DESCRIPTION	Q'TY
1	3-122-606-01	PACKING CASE	1
2	3-120-523-01	SIDE PAD	2
3	3-415-046-01	POLY SHEET	1
4	3-122-607-01	OPERATING MANUAL	1
5			
6			

SERVICE MANUAL



SPECIFICATIONS

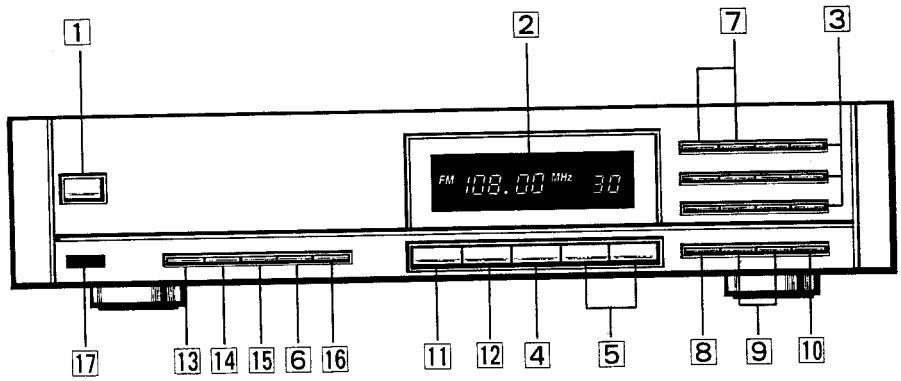
FM Tuner Section

Frequency Range	87.5 MHz to 108 MHz
Usable Sensitivity	11.2 dBf, IHF(1.0μV/75ohm)
50 dB Quienting Sensitivity	Stereo; 43.29dBf, IHF (40μV/75ohm)
Signal-to-Noise Ratio	Mono; 75dB (at 80dBf)
	Stereo; 68dB (at 80dBf)
Distortion (at 80 dBf)	Stereo, 0.5% (1kHz)
Alternate Channel Selectivity	90 dB (400kHz)
Stereo Separation	50dB (1kHz)
Frequency Response	+0.5 dB (30Hz to 15kHz)
	−0.5 dB (30Hz to 15kHz)
Image Response Ratio	60dB
If Response Ratio	100dB
AM Suppression Ratio	60dB
Antenna Input	75ohm Unbalanced

AM Tuner Section

Frequency Range	522kHz to 1629kHz
Sensitivity (IHF, Loop Antenna)	300μV/M
Selectivity	22dB
Signal-to-Noise Ratio	45dB
Image Response Ratio	40dB
If Response Ratio	50dB
Antenna	Loop Antenna

FRONT PANEL FEATURES



1. POWER switch
When this switch is set the on position, POWER is supplied to this tuner's main circuits.

2. DISPLAY indicator
This shows the frequency of station currently being received in digit form

3. STATION button
These are used to preset and recall broadcasting stations.

4. MEMORY button
This is used to memorize station. When the switch is depressed, the "MEMORY" indicator will light to memorized the frequency of any station, press the station call switch while the memory indicator is lighting up.

5. TUNING button
This is used to locate the station. Push either side of this button; the left side "DOWN" to go to a low, and the right side "UP" to go to a higher frequency.

6. DISPLAY mode

7. BAND button
These are used to select the FM, AM broadcasting bands.

8. SLEEP
If fressing the sleep button on any display mode, the below display comes on and also means 60 min sleep.

10. TIMER CANCEL button

11. MONO STEREO button
This is used to FM stereo broadcast will be heard in mono, this button will not function for AM reception.

12. MEMORY SCAN
If you press this button, the display scans only memorized preset stations for 5 seconds among 30 random presets.

13. STATION NAME button
This function mode can memorized the each preset (Random 30) station english name or frequency until 5 digits, maximum.

1) Press the station name button and then you will see below display
   K* — — —

2) With pressing the tuning UP or DOWN button, when you find desired character on first digit, please press the station name button.
   KO* — —

3) Press the tuning UP or DOWN button and press the station name button as we made (2)
   KOR* —

4) Repeat again
   KORE*

5) Repeat again
   KOREA

In order to memorizing press the memory button, and then select desired preset station number,
(Ex; Random preset station number, 12: Press button number 1 and 2)

14. AUTO MEMORY button

When the auto memory button is press memory is displayed for 5 second, if a preset button (M1 to M30) pressed within 5 second, automatic scanning starts. Auto memory is selected only for stations having good receiving

15. DIRET ACCESS

1) Press the AM or FM button as you may want.
2) Press the diret access button you willsee the drinking "AM" or "FM" on display for 5 seconds however, before 5 seconds press broadcasting frequency buttons (Ex: 951) and press diret access button.

16. HI-BLEND button

17. REMOTE SENSOR

ADJUSTMENT

FM Tuner Section

- Connect the FM signal generator(FM SG) to the FM antenna 75 ohm terminal through a 75 ohm coaxial cable.
- Set the tuner to the FM band.

*1) Tune the FM SG to the tuner.

*2) Connect the FM multiplex stereo signal generator to the FM SG external modulator terminal. Set the modulation to Main 1kHz/L+R/±50kHz deviation, Pilot 19kHz/±6kHz deviation.

Step	FM SG (1kHz, b 46kHz deviation)		Tuner Frequency display	Adjustment point	Adjustment procedure
	Frequency	Level			
1	98MHz(*1)	60dB	98MHz	T4 T5	Adjust DC Voltage between terminal T and T to 0 ± 30mV. Adjust until distortion at OUTPUT L terminal is minimum.
2	98MHz(*1) stereo modulation (*) (Main = 1KHz, L or R)	60dB	98MHz (Set to stereo)	VR3	Adjust until stereo separation at OUTPUT L or R terminal is maximum.
3	98MHz(*1) stereo modulation (*2) (Main = 1kHz, L or R)	60dB	98MHz (set to stereo)	IFT (within ± 90°)	Adjust until distortion at OUTPUT L and R terminal is equality minimum.
4	98MHz(*1)	21dB	98MHz	VR2	Adjust until TUNED indicator lights up

AM Tuner Section

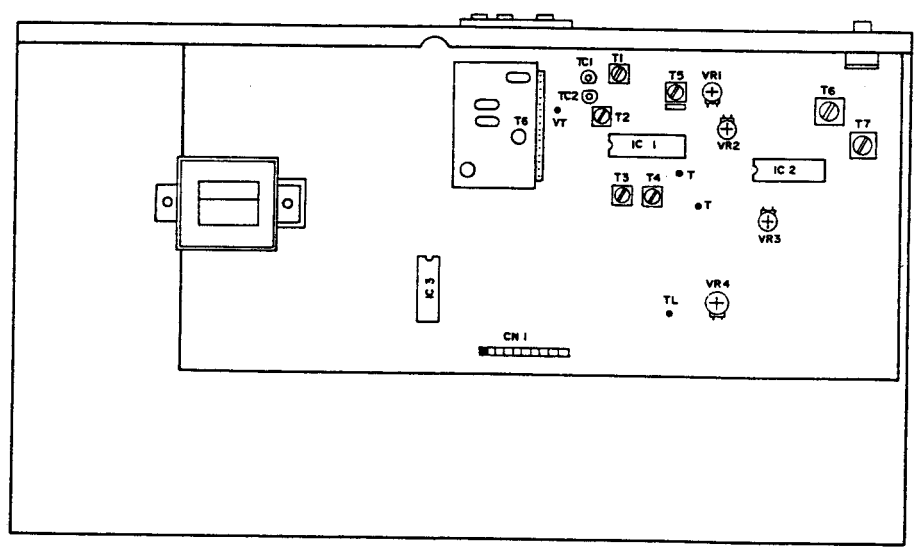
- Connect the furnished AM loop antenna between terminals AM ANTENNA and GND.
- Connect the AM signal generator to the AM TEST LOOP.

It is 60cm between AM loop antenna and AM TEST LOOP.

- Set the tuner to the AM band.

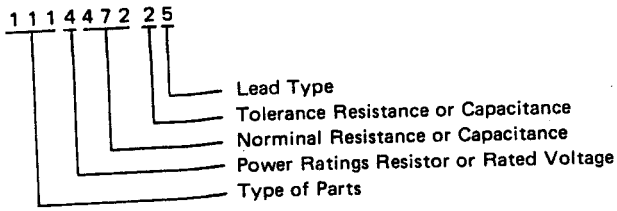
*3) Tuned the AM SG to the tuner.

Step	AM SG (400Hz, 30% modulation)		Tuner Frequency display	Adjustment Point	Adjustment procedure
	Frequency	Level			
1	No signal		522KHz	T2	1.0 ± 0.1V DC between terminal VT and ground.
2	No signal		1620kHz	TC2	8.0 ± 0.3V DC between terminal VT and ground.
3	Repeat step 1 and 2 until both specification are correct.				
4	603 kHz(*3)		50dB	T1	Adjust until maximum
5	1395 kHz(*3)		50dB	TC1	sensitivity is attained
6	Repeat step 4 and 5 until maximum sensitivity is attained.				
7	999 kHz(*3)		55dB	VR1	Adjust until TUNED indicator lights up



ELECTRICAL PARTS LIST

NOTE:
When ordering parts first convert parts number into code form as shown in the following examples.


1 1 1 4 4 7 2 2 5
Lead Type
Tolerance Resistance or Capacitance
Norminal Resistance or Capacitance
Power Ratings Resistor or Rated Voltage
Type of Parts

RESISTOR

ex) Power Ratings Resistors

8 ... 1/8W	4 ... 1/4W	5 ... 1/2W
1 ... 1W	2 ... 2W	7 ... 4W

ex) Resistor Value

479 ... 4.7Ω	560 ... 56Ω	681 ... 680Ω
822 ... 8.2KΩ	123 ... 12KΩ	224 ... 220KΩ

*CARBON film Resistor; 1 [1][1] 437225 (3.7KΩ, 1/4W)

CAPACITANCE

ex) Rated Voltage

0 ... 4V	1 ... 6.3V	2 ... 10V	3 ... 16V
4 ... 25V	5 ... 35V	6 ... 50V	7 ... 63V
8 ... 80V	9 ... 100V		

ex) Type of Ceramic Capacitor

71 ... CKDYB	75 ... CKDYF	80 ... CCDCH
88 ... CCDSL	84 ... CCDRH	86 ... CCDTH

ex) Capacitor Value

040 ... 4pF	470 ... 47pF	221 ... 220pF
182 ... 1800pF	103 ... 0.01 μF	473 ... 0.047 μF

ex) Tolerance Capacitance

0 ... C = ±0.25pF	1 ... D = ±0.5pF	2 ... F = ±1pF
3 ... G = ±2%	4 ... J = ±5%	5 ... K = ±10%
9 ... Z = +80% −20%	6 ... M = ±20%	

*ELECTROLYTIC	CAP:1 [4][2] 647365 (0.047 μF, 50V, ±20%)
*CERAMIC	CAP:1 [8][8] 647241 (4700pF, 50V, ±20%)
*MYLAR	CAP:1 [5][0] 647251 (4700pF, 50V, ±10%)
*STYROL	CAP:1 [5][3] 643141 (430pF, 50V, ±5%)

MAIN SECTION

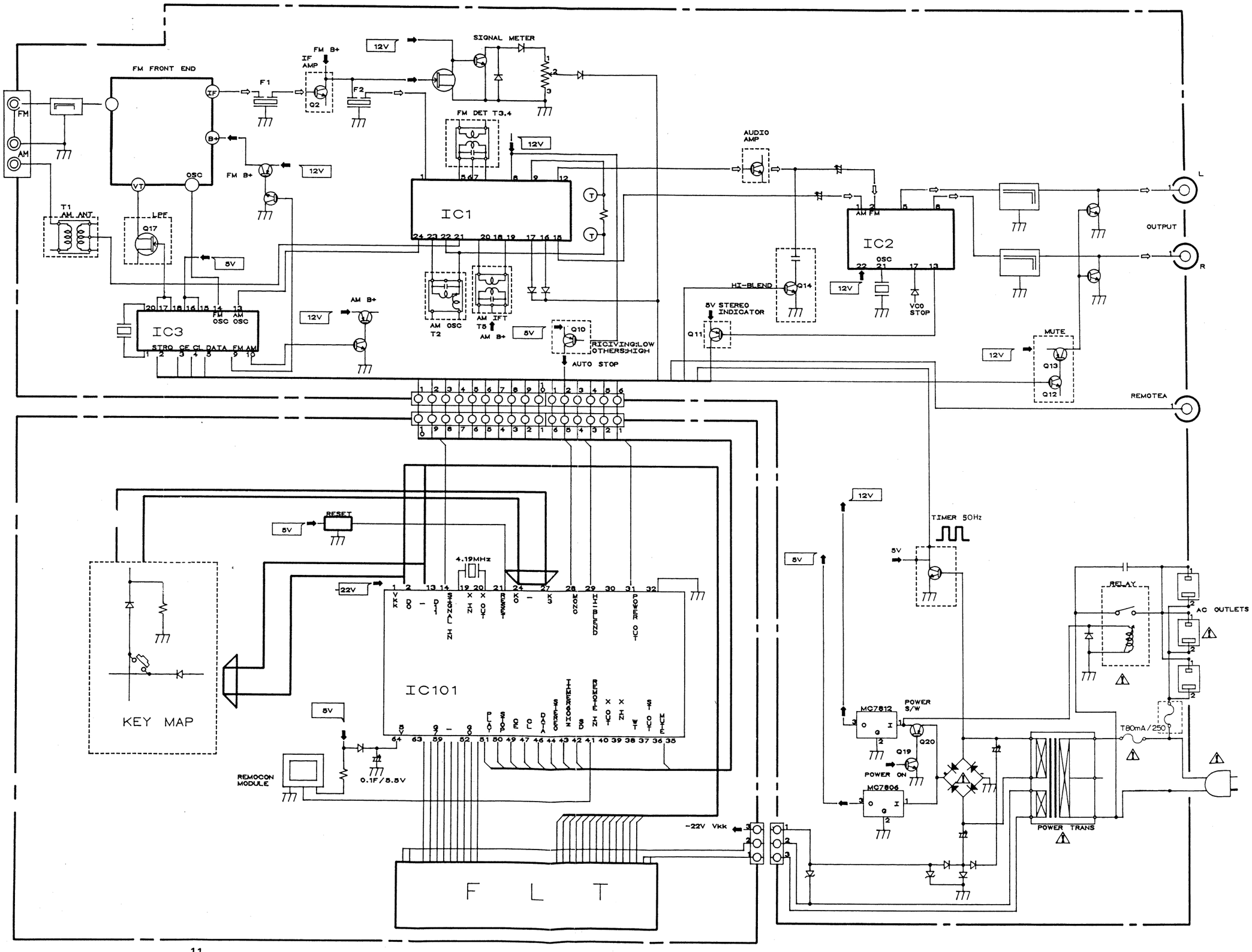
REF. NO.	PARTS NO.	DESCRIPTION
• IC's		
IC101	260012601	TMP47C 1270 V203
IC 2	244135372	LA3401
IC 1	244133172	LA1266
IC 4	244121771	KA7812
IC 5	244143842	KA7806
IC 3	244135272	LM7000
• TRANSISTORS AND FET		
Q17	240411131	2SK246GR
Q3	240410731	KTK161GR
Q4, Q2	240210125	KTC380 TM-O
Q20	240110321	KTB834-Y
Q18	240211815	KTC2240-GR
C6, 11	240011835	KTA1015-GR
Q19,7,9,5,15, Q16,77,	240211135	KTC1815-GR
Q12,14	240610915	KSR1003
Q8,13,10	240610715	KSR2001
• DIODES		
D1, 2	241508091	SVC321
D101,102,103, 104,105,106, 110,77	241358165	IN4003L
D109	242108241	IN756A
D108	242122035	IN969B
D3,4,7,8,9,10, 11,12,13,111, 112,113,114, 115,117,118, 201,202,203, 204,205,206, 207,208,209, 220,80,81,82, 222,	241409995	IN4148
D5, 6	241020995	1N60
• COIL AND OTHER'S		
F1,2	213830601	SFE10.7MS3G-HA
F3	213831201	SFU450B
F4	213831301	BFU450-C4N
F5	213835801	CSB456F11
F101	213835901	CST4.19MGW
T10	213852101	FILTER ANTIBODY
F201	213810201	X-TAL NSS-002-0
F.L.T.	214324101	8LT06GK FAT

REF. NO.	PARTS NO.	DESCRIPTION
BAND PASS FILTER	213860901	FILTER 88-108MHz
T1	212710601	COIL, AM ANTENNA
T2	212943501	COIL, AM OSC
T5	212712401	COIL, AM IFT
T4	212974701	COIL, FM DET1
T3	212974801	COIL, FM DET2
T6,7	213851101	FILTER, MPX
L1	10439221	COIL 3.9mH
FRONT END	212511101	SE2020F
RELAY	214011301	RELAY 24V(DC)
TC1,2	212111701	CVCNO6B200
TRACT SWITCH	220899901	S/W TACT
VR3	251222401	S.F. RESISTOR 220K
VR4	251210401	S.F. RESISTOR 100K
VR1,2	251247301	S.F. RESISTOR 47K
• RESISTORS		
R152	114112223	M.O. 1.2K, 1W
R153	114133023	M.O. 33, 1W
R11,101,37, 129, 142	11447025	C.F. 47, 1/4W
R143, 22, 154	11456025	C.F. 56, 1/4W
R29	111482025	C.F. 82 1/4W
R140, 123	111410125	C.F. 100 1/4W
R4, 135, 603	111422125	C.F. 220, 1/4W
R136, 12	111427125	C.F. 270, 1/4W
R10, 20	11433125	C.F. 330, 1/4W
R3	111439125	C.F. 390, 1/4W
R18,137,1	111447125	C.F. 470, 1/4W
R23,19,31	111410225	C.F. 1K, 1/4W
R21	111456125	C.F. 560, 1/4W
R17, 6	111412225	C.F. 1.2K, 1/4W
R155	111422225	C.F. 2.2K, 1/4W
R28	111427225	C.F. 2.7K, 1/4W
R141, 15, 113, 114, 104, 105, 106, 107	111433225	C.F. 3.3K, 1/4W
R151, 139, 33, 117, 130,131,121, 110,124,35		
R149,148,146, 145,138,133, 128,127,126, 502,24,109,25,26	111410325	C.F. 10K, 1/4W
R102	111456225	C.F. 5.6K, 1/4W

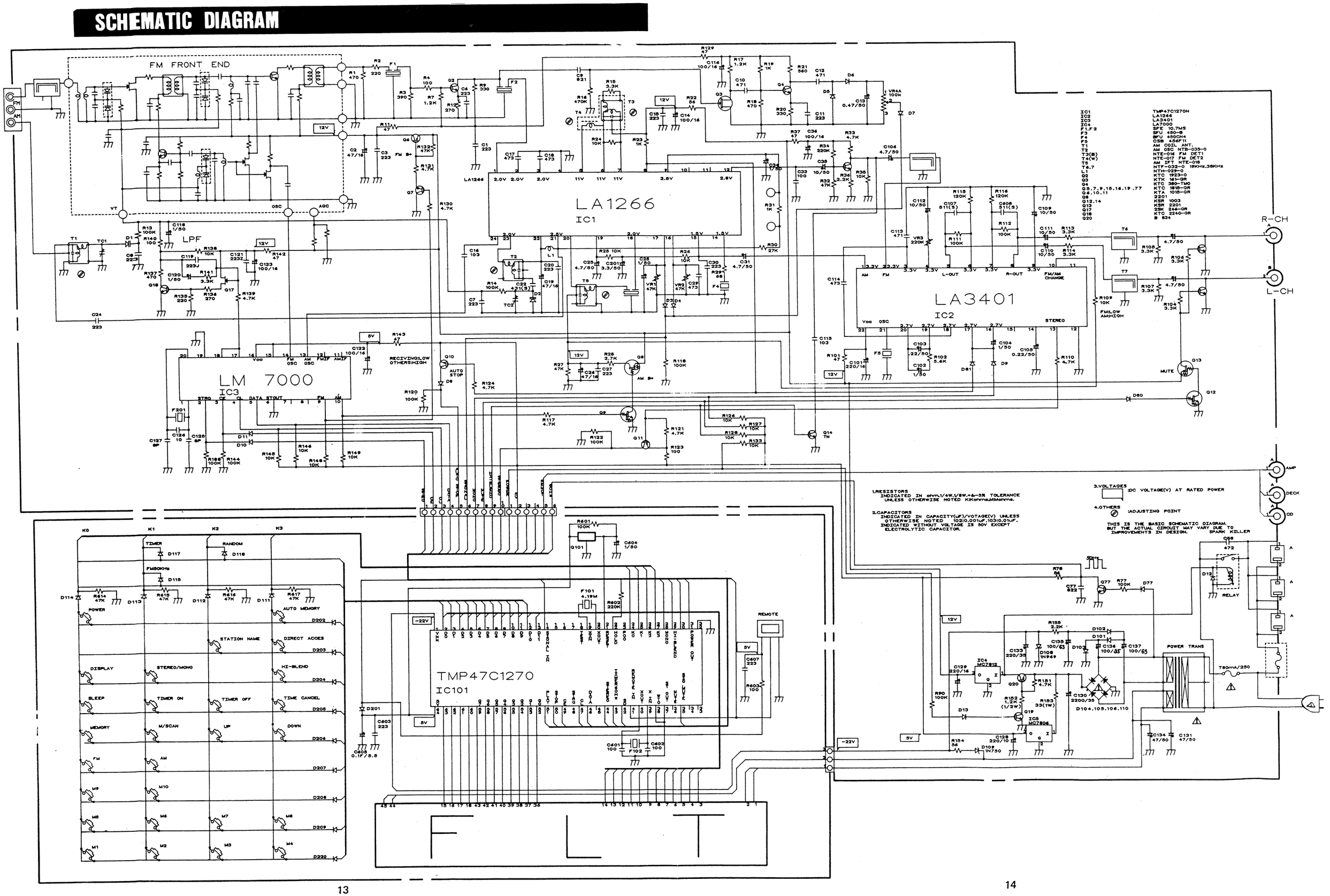
REF. NO.	PARTS NO.	DESCRIPTION
R132,27,32	1 11447325	C.F. 47K, 1/4W
R30	1 11427325	C.F. 27K, 1/4W
R16	1 11447425	C.F. 470K, 1/4W
R13,14,78,89, 118,120,122, 144,77,601,614, 615,616,617,90	1 11410425	C.F. 100K, 1/4W
R34,602	1 11422425	C.F. 220K, 1/4W
R115, 116	1 11412425	C.F. 120K, 1/4W
R500	1 11422325	C.F. 22K, 1/4W
R501	1 11415325	C.F. 15K, 1/4W
R36	1 1418225	C.F. 1.8K, 1/4W
R111, 112	1 1415425	C.F. 150K, 1/4W
• CAPACITOR		
C21	180608015	CCD CH, 0.5PF, D
C33	188610145	CCD SL, 100PF, J
C10,12,113	188647145	CCD SL, 470PF, J
C9	188682145	CCD SL, 820PF, J
C125,127	180630045	CCD CH, 30PF, J
C115, 117, 16	175610395	CKDYF, 0.01μF, Z
C8,7,6,1,3,20, 24,27,121,11, 607,15,603,17,18	175622395	CKDYF, 0.022μF, Z
C114,29,500, 501	175647395	CKDYF, 0.047μF, Z
C22	153647141	CQSA, 470PF, J
C107, 108	153633141	CQSA, 330PF, J
C77	150682245	CQMA, 8200PF, J
C119, 30	160622345	CQMA, 0.022μF, J
C604,120,34, 102,104,118, 28	141601065	CEA, 1μF/50V
C201	141633965	CEA, 3.3μF/50V
C25,31,106	141647965	CEA, 4.7μF/50V
C105	141622865	CEA, 0.22μF/50V
C112,35,109, 110,111,26	141610065	CEA, 10μF/50V
C13	141647865	CEA, 0.47μF/50V
C2,19,131,134	141347065	CEA, 47μF/ 16V
C14,36,116, 122,123	141310165	CEA, 100μF/ 16V
C128	141222167	CEA, 220μF/10V
C129,101	141322165	CEA, 220μF/16V
C133	141522167	CEA, 220μF/35V
C137	141510165	CEA, 100μF/35V
C135,136	141610165	CEA, 100μF/50V

REF. NO.	PARTS NO.	DESCRIPTION
C130	141522267	CEA, 2200μF/35V
C103	141622867	CEA, 0.22μF/50V
C88	199899901	SPARKILLER CON.
C605	199113401	DB–5R5D104
• OTHERS		
TERMINAL, ANT	215574201	75OHM PAL+AM
REMOCON MODULE	212580201	KRM-33G
TRANS, POWER	213140901	DC24V, AC4.8V VDE
CORD, AC	221110902	NDG-009-0, VDE
AC RECEPTANCLE	215518301	S-16536, SEMKO
AM ANTENNA	221335302	AM LOOP ANT
PIN CORD	215821601	NDE-016-0
BATTERY ASS'Y	215420301	(AAM) 1.5V
FUSE	299821701	T80mA/250V (SEMKO)
FUSE	218862001	T4A/250V(SEMKO)

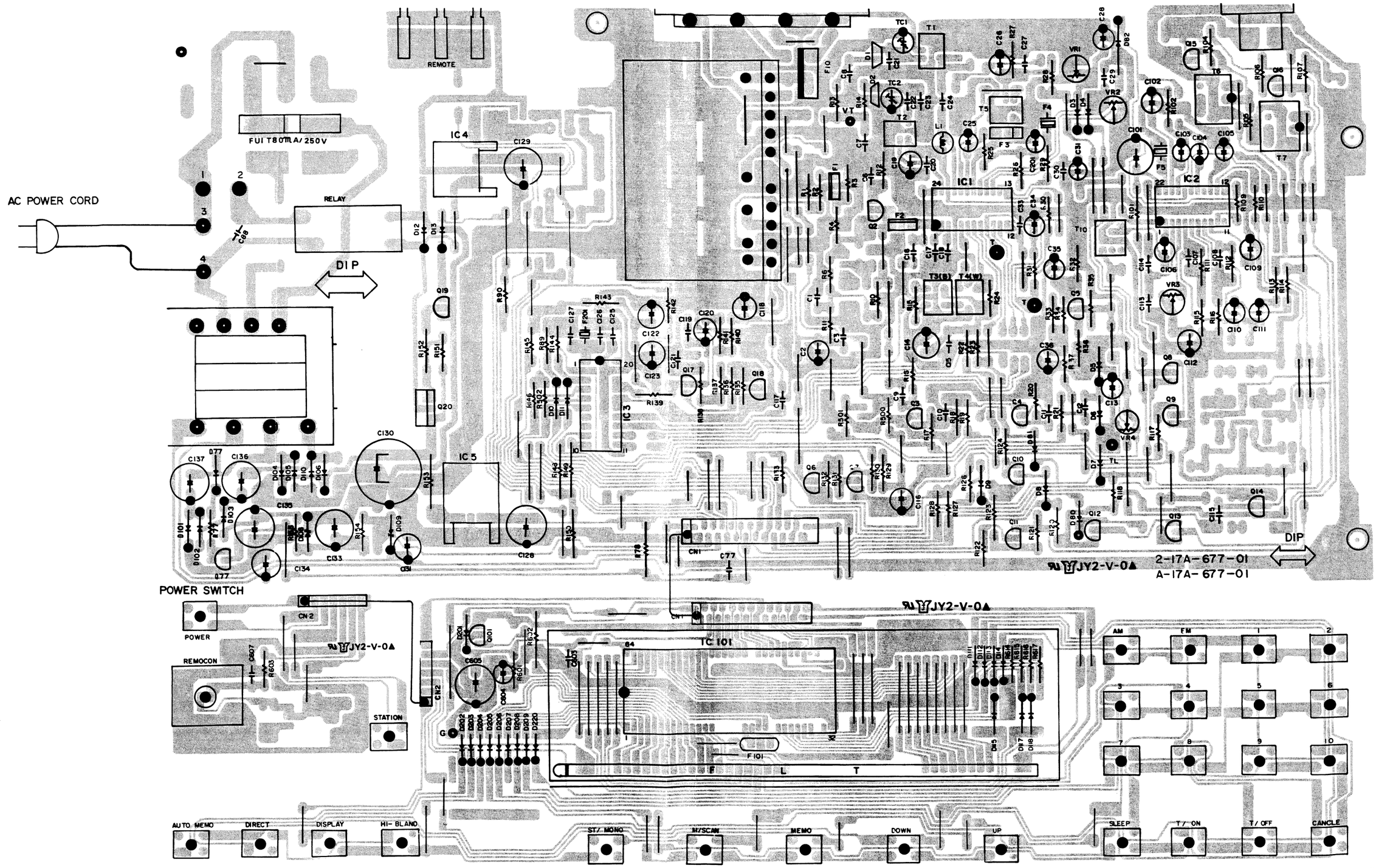
BLOCK DIAGRAM



SCHEMATIC DIAGRAM



WIRING DIAGRAM

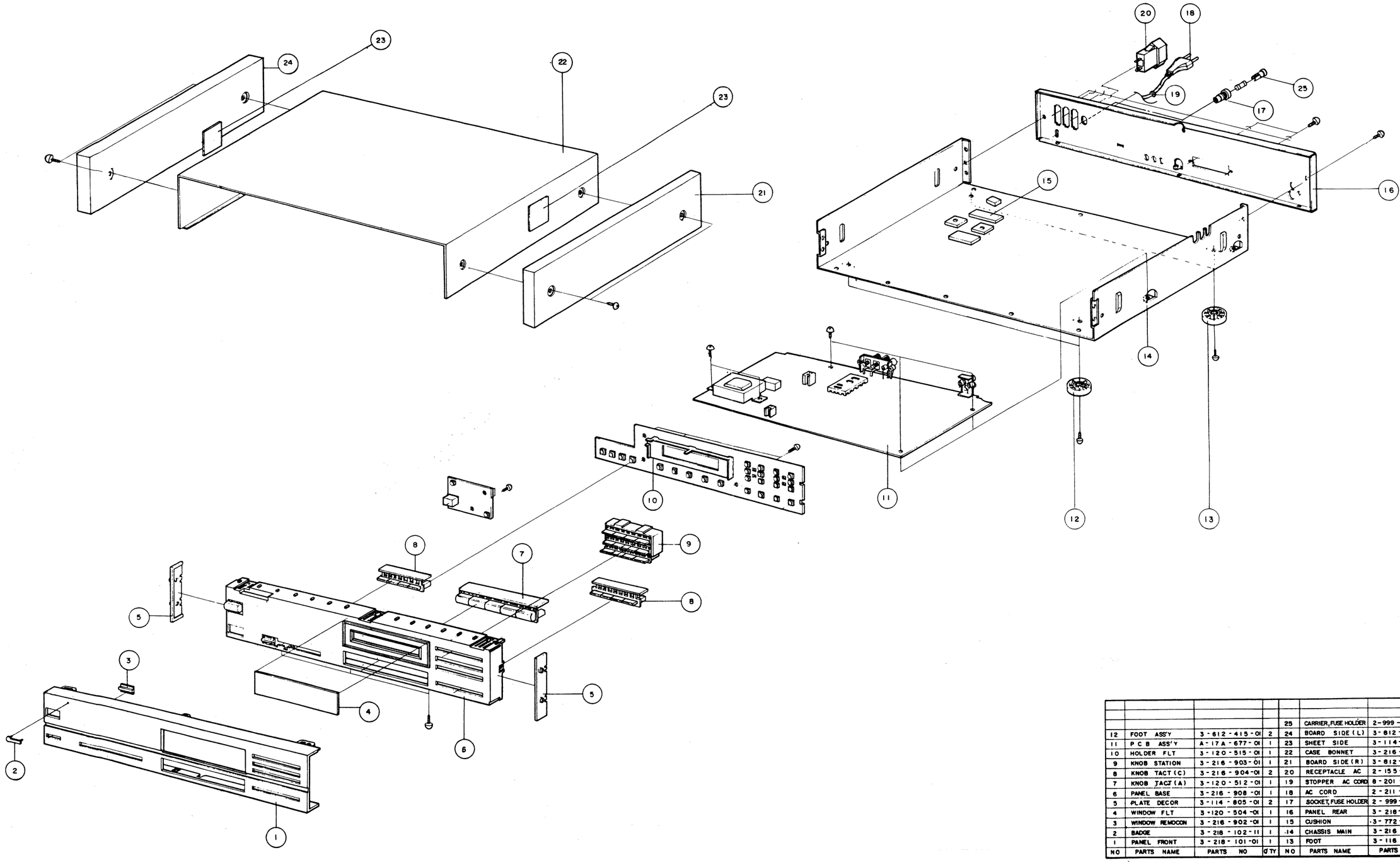


15

CONTROL SWITCH ASS'Y

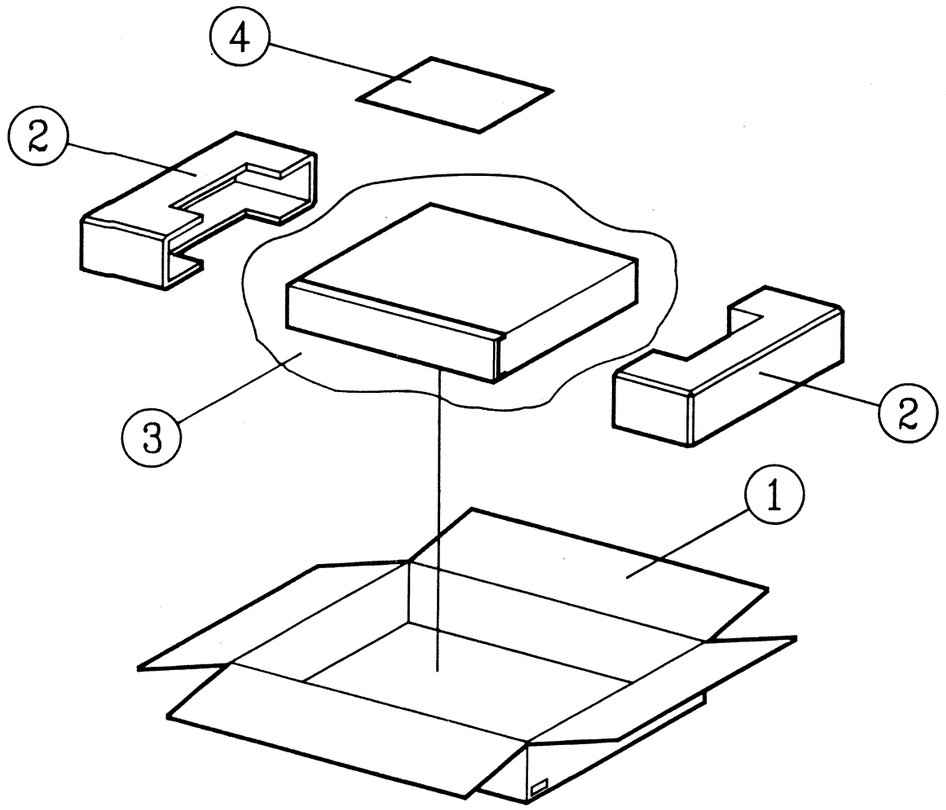
16

EXPLODED VIEW



				25	CARRIER, FUSE HOLDER	2-999-113-01	1
12	FOOT ASS'Y	3-612-415-01	2	24	BOARD SIDE (L)	3-612-511-01	1
11	P C B ASS'Y	A-17A-677-01	1	23	SHEET SIDE	3-114-727-01	2
10	HOLDER FLT	3-120-515-01	1	22	CASE BONNET	3-216-909-01	1
9	KNOB STATION	3-216-903-01	1	21	BOARD SIDE (R)	3-612-512-01	1
8	KNOB TACT (C)	3-216-904-01	2	20	RECEPTACLE AC	2-155-183-02	3
7	KNOB TACT (A)	3-120-512-01	1	19	STOPPER AC CORD	8-201-115-01	1
6	PANEL BASE	3-216-908-01	1	18	AC CORD	2-211-109-02	1
5	PLATE DECOR	3-114-805-01	2	17	SOCKET, FUSE HOLDER	2-999-112-01	1
4	WINDOW FLT	3-120-504-01	1	16	PANEL REAR	3-218-103-01	1
3	WINDOW REMOCON	3-216-902-01	1	15	CUSHION	3-772-009-01	2
2	BADGE	3-218-102-11	1	14	CHASSIS MAIN	3-216-907-03	1
1	PANEL FRONT	3-218-101-01	1	13	FOOT	3-116-127-01	2
NO	PARTS NAME	PARTS NO	Q'TY	NO	PARTS NAME	PARTS NO	Q'TY

PACKING



NO.	PARTS NUMBER	DESCRIPTION	Q'TY
1	3-218-104-01	PACKING CASE	1
2	3-116-506-02	SIDE PAD	2
3	3-415-046-01	POLY SHEET	1
4	3-218-105-01	OPERATING MANUAL	1
5			
6			